RIECS concept

Deliverable 4.1: Engagement methodology protocol

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Description	This report outlines the engagement methodology to involve key stakeholders in co-designing the future RIECS infrastructure, ensuring inclusive, structured, and impact-driven participation.
Key words	Citizen Science, Stakeholders, Co-design, Engagement, Workshops, Research Infrastructure, Methodology, Participation, User Stories, Public Engagement

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Acronym	Open form
EC	European Commission
HE	Horizon Europe
GA	Grant Agreement
CA	Consortium Agreement
PO	Project Officer
PC	Project Coordinator
WP	Work Package
WPL	Work Package Leader
PR	Periodic Reporting
CS	Citizen Science
PMO	Project Management Office
KIP	Key Impact Pathways
DECP	Dissemination, Exploitation and Communication Plan
SDG	Sustainable Development Goals
RIECS	European Research Infrastructure for Excellence in Citizen Science

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1. Executive Summary

The present deliverable is a blueprint of the engagement of multiple stakeholder groups throughout the duration of RIECS-Concept. Ten stakeholder groups will be engaged in the co-designing and co-creating of the concept of the European Research Infrastructure for Excellence in Citizen Science (RIECS).

As a first step, we map the internal coordination between the 13 partners in 8 countries across Europe when engaging the different stakeholder groups in workshops, surveys and (semi-)structured interviews. This first section will detail the coordination between partners in the planning and implementation of engagement activities, their validation and different iterations, the communication of results and conclusions and their use in project outputs, as well as practical tools and platforms used for coordination.

The second chapter of the deliverable defines the different stakeholder groups. It starts by outlining an engagement framework, principles and best practices. It includes definitions of different maturity levels to guide partners in adjusting their engagement activities to the maturity level of the group, as well as a preliminary list of other stakeholder groups and experts that might be called on to contribute to the co-design. For each of the stakeholder groups, we define the research fields, the needs of each group, and subsequently, the opportunities these needs create for RIECS-Concept to engage each particular group; finally we define the challenges each group will pose and the key messages we plan to address them with, in order to overcome them and firstly onboard, and then engage them in the co-design process. This section is intended to outline our initial understanding of each stakeholder group.

The final chapter of the deliverable maps the two engagement phases, including the project outputs and tasks that they will inform; the engagement activity (goals, stakeholder groups involved), and the input needed from each set of engagement activities (including documentation of implementation and participant details).

The present protocol will be updated after the T5.1 CS stakeholder summit is completed in M19. Furthermore, following the stakeholder summit, we will also conceptualise a version of the present document intended to be used by other research infrastructures beyond the project itself. This Engagement at A Glance will be a compact document summarising our strategy and the most important lessons drawn from its implementation.

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2. Internal Workflow

2.1. Coordination & communication among partners

2.1.1. Individual Partners Responsibility

The coordination among partners is essential to the extraction of valuable insights from the engagement activities for the development of RIECS-Concept. The communication between partners will use the same structures detailed in D1.1 with regards to regular meetings, internal discussions and the sharing of files.

Moreover, with partners involved in different capacities in the engagement activities and the deliverables they inform, we deem it essential to define roles and responsibilities, as well as information flows from the start, as follows:

Partners running engagement activities:

Stewards

Stewards are partners responsible for running workshops with an assigned stakeholder group. They will lead the efforts to:

1. **Compile lists of potential international stakeholders.**

2. **Initial outreach.** The stewards are expected to initiate the outreach, except in cases in which partners from other countries are already in contact with the nominated stakeholder or in case of any language barrier, the stewards should delegate to the relevant partner. The initial outreach will introduce stakeholders to the project (see the paragraph on Key Messages in Section 2.2) and outline the extent of the commitment (potential workshop dates, duration, topics, potential follow-up activities).

3. **Workshop Central Room Maintenance** (a coordination document, more details in section 1.3 of the present deliverable). Each steward is expected to input the list of contacts in the Workshop Room list and update it regularly with new information such as *user stories & workshop documentation (filled out after each activity), status, etc.*

This should also include a list of all the workshops planned and already conducted by the partners, including dates, location etc.

1. **Curate workshop participants.** Stakeholders will be engaged in activities according to their expertise/role in CS projects, and geographical location. The aim

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is to have a diverse set of individuals for each engagement activity to get a comprehensive picture of the needs of a group. In some instances, a particular level of expertise in a particular SH group may be required for high quality outputs, or refining previous outputs, in which case, less diverse participation may be favoured. Partial repeat participation of stakeholders is desirable. Ideally each workshop iteration would have a number of participants that have already taken part in one workshop, as well as new participants.

2. **Attend workshops on methodology.** Stewards are expected to coordinate with other stewards on certain aspects of the workshop methodology. An initial workshop is intended to map out the methodology for Phase 1. Subsequent methodology reflection meetings are planned throughout the two engagement phases; to reflect on the activities implemented and the lessons learned from them and adapt the strategy is needed.

3. **Run workshops.** Each partner is expected to run workshops with the stakeholder group they steward (2 workshops/partner in Phase 1; 2 workshops/partner in Phase 2), or delegate to the relevant local partners in case of language barrier, in addition to the citizen workshops (4 workshops/partner in Phase 1, 2 workshops/partner in Phase 2).

4. **Document workshops.** All partners are expected to ensure the forms we use on the engagement activities are accurately filled out and uploaded to the shared folder in the Work Package 4 named *Documentation Engagement Activities* so that all partners have access to the information.

   Folder structure. First the folders are divided by Stakeholders groups, e.g. Citizens, Multi Stakeholders. Within each of these folders, there will be other folders dedicated to the engagement activities, named consistently as follows: consecutive numbers, date, type activity (workshop, survey, interview), online or onsite and finally title event (example Consecutive Number_DD/MM/YY_Type Activity_online/onsite_title).

5. **Attend bi-monthly update meetings and methodology reflection meetings**. For further details, see paragraph 1.2.

Partners leading deliverables informed by engagement activities are expected to:

1. **Attend methodology workshops and methodology reflection meetings** (for more details, see paragraph 1.2). Their input is invaluable for the development of the documentation templates and the design of the workshops with topics relevant for their deliverables.

2. **Organise further meetings** as/when needed to develop the deliverables (beyond those already detailed in paragraph 1.2 which are intended to ensure the continuous

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alignment among partners running the workshops, as well as between them and those responsible for deliverables).

Ars Electronica, as the partner responsible for the current protocol, will ensure its implementation and will:

1. Set up bi-monthly meetings.
2. Organise the methodology workshop. AE will support ZSI with the organisation and moderation of the workshop.
3. Set up methodology reflection meetings.
4. Take meeting notes and share them with partners.
5. Send regular reminders for partners to update the Workshop Central Room, so that information is available for all others in a timely manner.
6. Send regular reminders for the different milestones defined in Annex 3 - Timeline.

2.2. Partner Meetings & Consultations

Methodology Workshop

We plan to have a methodology workshop in M9 (September 2025) including all partners who are expected to run engagement activities (workshops, interviews, surveys), as well as all partners leading deliverables. The workshop will be dedicated to

- aligning on the principles of engagement with stakeholders

- presenting the frameworks and methodologies of engagement and co-design
- mapping best formats and best practices for engaging each stakeholder group
- collecting strategies for mediating disagreements and ensuring that all voices are heard and respected
- defining roles and responsibilities for participants and facilitators

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- mapping the needs of the different partners leading deliverables and deciding on the **topics** of the workshops

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- preparing materials on RIECS to ensure all stakeholders, regardless of their background and technical insight, contribute effectively

- (optional) agree on a protocol for assessing the maturity level of participants

AE will support ZSI with the organisation and moderation of the workshop. WP4 and WP5 leaders can also be involved in creating the content of the workshop and defining the relevant agenda points. All partners are expected to attend and contribute.

Bi-Monthly meetings

Furthermore, bi-monthly meetings dedicated to updates on the progress made with the engagement activities by each partner, as well as to consult with others on potential issues that might arise will be set up by AE.

Methodology reflection meetings (after every workshop cycle).

At the end of each workshop round, as outlined in both phase 1 and phase 2 of the engagement process, partners will meet to review their workshop documentation and draw conclusions for the following round of workshops.

Each partner is responsible for filling out a workshop documentation and summarising the most important points to present in the meeting. The documentation also includes engagement activities organised in the context of conferences as well.
On a rotational basis, partners will play a key role in moderating and setting the agenda for these meetings. AE will always be in charge of taking notes for each of the meetings and sharing them with the rest of the partners.

In addition to this, the General Assembly (GA) ensures strategic oversight. Moreover, the Google drive folder and the mailing list that have already been set up will ensure a smooth coordination between partners.

2.3. Workshop Room Control

The project will set up a Workshop Room Control system in an excel sheet to collect all the workshops happening during the RIECS-concept project. The excel sheet will be set up and adapted to fit the needs of the project and allow it to collect potential SH contacts, workshop documentation & user stories in one central document.

The Workshop Room Control sheet setup will be led by Ars Electronica. All partners are expected to contribute. Each organisation nominates one person in charge of inputting and updating contacts in the sheet. Updates are done on a regular basis (both before and after an engagement activity).

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The Workshop Room Control will include the following fields for each contact to ease progress monitoring and the contacts collection process by all partners:

- *name of organisation*
- *person of contact*
- *email / phone number*
- *stakeholder group (predefined with our existing categories, preferably also functions as a filter)*
- *type of involvement*
    - *interview*
    - *workshop*
    - *survey*
    - *other*
- *log of participation in RIECS activities*
    - *contacted by (and when)*
    - *activity run by*
    - *contacted by and when (if multiple activities)*
    - *activity run by and when (if multiple activities)*
- *documents/PDFs (filled out after each activity if need be)*
- *transcripts of discussions (if need be)*
- *status: to be contacted | contacted | confirmed involvement | involved*
- *POC in RIECS-Concept*

There will also be a folder for each engagement activity to collect the workshop documentation, transcripts, visual materials and anything that would be important for documentation of the engagement activities, which the excel sheet will link to.

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2.4. Ethics and Data Management Plan

In the RIECS-concept project we submitted in Month 5 (M5) Deliverable 1.3, the Ethical Management Plan. In the project we are going to have the involvement of a range of stakeholders and citizens in different regions, where the partners of the project are based. All the partners are in line with, and responsible to adhere to, the Horizon Europe ethics framework.

All the participatory engagement activities that the consortium partners will conduct are happening on the bases of strict ethical safeguards, including informed consent, anonymisation protocols, and clear communication of their rights as participants in any activities during the project duration.

The Ethical Management Plan, covers the information that all the consortium members will follow in their engagement activities with the: Data protection and Privacy with the commitment on protection of personal data, data management, gender and inclusivity considerations, in specific to the informed consent for the participants in any engagement activities. There are corresponding templates designed for informed consent in compliance with GDPR and ethical standards for any activities the consortium partner will be conducting during the duration of the project. For more details on the Ethics and Data Management Plan, consult the Deliverable 1.3. Connected to the ethical management plan, the project is submitting D1.4 - Data Management plan in M6 to ensure that all the partners are responsibly managing the data generated during the project and align with the FAIR principles, ethical standards and data protection strategies of General Data Protection Regulation (GDPR, Regulation EU 2016/679) and the Findable, Accessible, Interoperable, Reusable (FAIR) principles in the RIECS-concept.

2.5. Use of Outputs

The results of the engagement activities will inform the different deliverables and milestones that will lead to the development of RIECS-Concept.

Internally, the results of the engagement activities will be communicated (1) in methodology reflection meetings, (2) user stories & workshop documentation, (3) further meetings organised by task leaders in WP 4 & WP5, (4) and where relevant consortium meetings.

Externally, the results of the engagement activities will be summarised in policy briefs, scientific publications, presented in events (e.g., the Ars Electronica Festival), or published on platforms such as, Zenodo and EU-Citizen.Science. The communication strategy for these resources is detailed in the Dissemination, Exploitation and Communication Plan (DECP, D6.1), led by VT.

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3. Stakeholder Groups

3.1. External Stakeholders | General engagement guidelines

3.1.1. Framework

During the Methodology Workshop the partners will discuss and agree on the frameworks of engagement and co-design they will use during both engagement phases.

Some of the frameworks of engagement and co-design that will be considered are:

- Theoretical framework developed by Sonia Liñán, Xavier Salvador, Ana Álvarez, Andrea Comaposada, Laura Sanchez, Nuria Aparicio, Ivan Rodero and Jaume Piera.[1]

This is a new theoretical engagement framework for citizen science projects using a multi-temporal approach to address long-term public engagement challenges.

While this is a framework proposed in order to keep volunteers motivated and engaged for long periods, a requirement for many citizen science-monitoring programs, the consortium will use elements of it that also apply to the engagement and motivation of stakeholders at the level of the infrastructure development and design.

- A "hands-on" framework based on McKercher, K. A. (2020). Beyond sticky notes. Doing co-design for Real: Mindsets, Methods, and Movements, 1st Edn

Beyond defining co-design - as a movement, as processes, mindsets and principles, as well as an ever-expanding set of creative and care-full methods and tools - and outlining the co-design principles -prioritise relationships, share power, build capability and use participatory means -, this method offers also very practical resources that can help run co-design activities.

- The IAF Library, a repository of tools for co-designing
- The Cos4Cloud co-design and testing methodology

The Cos4Cloud project uses co-design methodologies for prototyping the services from the bottom up, with the quadruple helix, to allow for customization at all required phases. The breakdown of the co-design process in different phases can be extremely useful to our project.

[1] Sonia Liñán et al 2022 Environ. Res. Lett. 17 105006

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More details about this methodology here.

All these methodologies will be summarised and discussed in the Methodology Workshop, and partners will agree on the features or elements of each of these frameworks that would best serve the co-design of RICS-Concept. They will then be incorporated in the design of the engagement activities, considering the goals of each engagement activity, the target group, their background and maturity level.

3.1.2. Principles & Best Practices

Throughout both phases of the stakeholder engagement, we will be guided by principles and best practices extracted from similar initiatives. The stakeholder engagement principles and best practices to be followed in the context of RIECS-Concept will be developed during the Methodology Workshop.

Some examples of principles and best practices to be discussed are:

Inclusivity and Diversity

- Ensure broad representation of stakeholders (e.g., users, community members, experts, decision-makers).
- Include voices from underrepresented or marginalized groups.
- Consider accessibility needs (e.g., language, mobility, cognitive).

Clear Purpose and Objectives

- Clearly define the goals of the workshop or survey.
- Communicate the intended outcomes to participants.

Transparency and Ethics

- Explain how input will be used and who will see the results.
- Obtain informed consent and maintain data privacy and confidentiality.

Evaluation and Reflection

- Evaluate the effectiveness of your co-design and survey methods.
- Reflect on what worked and what didn't, and document lessons learned.
- Integrating Evaluation into Stakeholder Engagement.

Relationship Building

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- Use the process to build trust and long-term relationships with stakeholders.
- Acknowledge contributions and share credit for ideas and outcomes.

The documentation of workshops and related interactions should not only capture descriptive details but also begin to collect early insights into potential impact. Stewards are therefore encouraged to complement their documentation efforts with reflective elements on the perceived success or limitations of each engagement activity. This includes gathering observations on stakeholder responses, shifts in understanding or attitudes, and the emergence (or lack) of actionable outcomes. Moreover, initial ideas about how to assess the longer-term effects of engagement —— such as influence on RIECS outputs, relevance of co-designed elements, and changes in institutional positioning —— should be captured and regularly revisited.

These observations should serve as building blocks for a more comprehensive evaluation framework that can later be applied to the RIECS infrastructure as a whole. In this sense, the evaluation of engagement is not an end in itself, but a formative step towards establishing context-sensitive criteria, indicators, and tools for assessing the effectiveness, responsiveness, and long-term value of the infrastructure. Methodology reflection meetings, documentation templates, and workshop summaries should therefore be adapted to explicitly include evaluative components that feed into this framework-building process. These evaluative reflections will inform the development of suitable indicators and methods for accompanying and measuring impact over time, contributing to a more robust, adaptive, and accountable engagement strategy. The methodology reflection meetings are well positioned to become the locus for such evaluative exchanges and should integrate this dimension explicitly into their agenda.

3.1.3. Stakeholders Maturity Levels

This section provides a framework for assessing the maturity levels of stakeholders in relation to (1) their knowledge and engagement with citizen science, (2) their technological knowledge, with expertise in designing or managing in research infrastructure (3) their expertise in one or more scientific domains relevant to RIECS-Concept (such as environmental monitoring, health, or climate), as well as (4) their position within or connection to organised communities or networks (local, national or international). Understanding stakeholders' positioning across these dimensions helps us plan appropriate engagement strategies. However, we must avoid over-engineering this analysis. Our goal is not to build a perfect classification system, but to ensure we gather valuable and diverse input —— regardless of where it comes from. Understanding stakeholders' positions along a maturity continuum is a critical first step in designing appropriate engagement strategies

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that are contextually sensitive and aligned with both local realities and institutional frameworks.

Firstly, stakeholder maturity, in the context of this project, refers to the degree of familiarity, understanding, and readiness of SH to engage with citizen science practices. It is not a measure of authority or influence, but rather of conceptual awareness and practical experience in participatory research methodologies. Maturity levels may be assessed along the following indicative dimensions:

- **Awareness**: Ranges from no exposure to citizen science concepts to comprehensive knowledge of its principles and applications.

- **Experience**: Includes the extent of prior involvement in citizen science projects, whether as facilitators, contributors, or institutional supporters.

- **Institutional Integration**: Reflects the presence of policies, frameworks, or resource allocations that formally recognise or support citizen science initiatives.

- **Attitudes and Openness**: Encompasses perceptions of citizen science, including willingness to engage in co-creation processes and recognition of non-traditional knowledge sources.

Where relevant and possible for the stakeholder engagement activity, the maturity assessment should be carried out as an initial step prior to the design and implementation of engagement activities. The findings will inform the selection of communication strategies, capacity-building formats, and participation mechanisms that correspond to the specific needs and potential of different stakeholder groups. All stakeholders, regardless of their maturity level, will be involved in the co-design process.

Maturity assessment methods may include structured interviews, stakeholder self-assessment tools, document analysis (e.g. institutional strategies or prior project reports), and observation of stakeholder interactions in relevant settings. Wherever possible, triangulate data sources to ensure reliability. The purpose of this assessment is not to categorise stakeholders hierarchically, but to support the development of differentiated engagement pathways. It enables project partners to adapt their approaches to stakeholder diversity and enhance the relevance, effectiveness, and inclusivity of citizen science initiatives within the project.

The maturity assessment process will be discussed and agreed upon by partners in the Methodology Workshop.

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3.1.4. Other relevant expertise for the project.

In the second part of the project, partners might consider including in the co-design sessions participants with in depth and specific expertise, relevant to the project such as, infrastructures/technologies, open data, legal aspects, privacy or ethics.

RIECS-Concept will gain a deep understanding of how people actually carry out research and citizen science —— what tools they use, the challenges they face with data, and their real-world needs. The project's role is to translate these insights into the RIECS concept. To do so, both in-depth exchanges with practitioners and high-level dialogue with experts will be key complementary pathways of engagement.

3.2. Stakeholder Groups | Definitions & Onboarding Strategies

The project will seek to engage a wide range of actors in different ways and thus contribute differently to the conceptualisation of RIECS.

In the context of the present engagement protocol (the terminology might differ in other contexts), we distinguish between users - those who will utilise the RIECS in their day-to-day activities -, and multipliers - those who will promote or support it at a national or international level. The co-design will involve both the voices of those on the ground and the voices of those who act at a policy level and can make possible as well as promote research infrastructures such as ours.

Citizen Scientists and practitioners will be the primary users of the RIECS. Their contribution to the development of the concept is crucial for creating a relevant infrastructure that meets the diverse needs of various citizen science initiatives. Other users groups such as researchers and scientists, CS networks, NGOs, technology providers, private companies, and education systems, will also be involved in the co-design of the RIECS to ensure that beyond helping citizen science initiatives, the research infrastructure also helps those who would like to integrate CS results and outputs into their own practice.

Each of the stakeholder groups (aside from the citizens) will have a **steward** assigned (from the members of the consortium), based on the field of expertise and the already existing connections with the specific stakeholder group. The stewards will be responsible for

- stakeholder mapping, outreach, onboarding and engaging the stakeholder group
- documenting the workshop, reflecting on and improving the methodology

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- the collection and analysis of user stories and their translation into services, resources and functionalities

Having stewards for each stakeholder group has a set of advantages:

1. It makes outreach,onboarding and engagement easier, as it makes use of the partner's/steward's existing network and expertise.

2. It allows for reflection on the methodology used in different workshops, and more informed decisions on its improvement.

3. It enables a consistent method of data collection and analysis, allowing the team to draw conclusions from data gathered in a standardised way.

The stakeholder engagement will be divided into two phases. The first phase focuses on the technical elements and addresses a fundamental question: What type of services, resources, and/or functionalities should the infrastructure provide to genuinely benefit stakeholders and achieve excellence in citizen science (CS). The second stage is dedicated to refining the initial draft of services, resources, and functionalities, while also incorporating new technical (data and metadata) and non-technical aspects. We consider the practical requirements for bringing RIECS to life, including governance, financial sustainability, collaborations, and the essential support from key stakeholders. This engagement will involve collecting **user stories** to explore the needs and wants of future end-users.

The engagement strategy will combine early involvement of well-connected actors with a continuous expansion toward a broader and more diverse range of stakeholders. This includes citizens and other key groups across disciplines, sectors, and regions, ensuring both depth and inclusiveness throughout the co-design and validation of the infrastructure concept.

The main technical topics we focus on include (but are not limited to):

Feasibility and Integration of Technological Components

The European Citizen Science landscape is rich but fragmented, with numerous tools and platforms operating in isolation. This hampers interoperability, limits reuse of results, and reduces the overall impact of citizen-generated data. By assessing existing services and tools across Europe, RIECS-Concept ensures a comprehensive mapping of the current ecosystem and identifies best practices and critical gaps. The resulting catalogue of services and resources (KER1) will serve as a foundational component for the future infrastructure. Its integration into a cohesive conceptual design (KER2) addresses the need for interoperability with European Research Infrastructures and EOSC, ensuring cross-disciplinarity and alignment with FAIR data principles and open science mandates. This step is crucial to reduce duplication, enhance scientific value, and foster collaboration across sectors and disciplines.

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Software and Middleware Architecture

The conceptual design of RIECS places strong emphasis on open-source, federated, and modular architectures. These are scalable, community-driven technologies that support participatory computing and data collection, and are already recognised in EOSC-related projects. Reusing existing citizen-owned digital devices (e.g. smartphones, sensors, desktops) aligns with the principles of cost-efficiency, sustainability, and inclusiveness, while lowering technical entry barriers. Interfacing with established scientific tools and infrastructures – including EOSC-Core and domain-specific RIs (e.g. LifeWatch, OPERAS) – ensures that citizen-generated data can be validated, integrated, and reused across the broader European research data ecosystem.

Data and Metadata Management

To fully integrate citizen science into the European Open Science Cloud (EOSC) and align with Common European Data Spaces, RIECS-Concept will develop a conceptual model for data and metadata integration (KER3). This includes mapping citizen-generated datasets, establishing metadata standards, and ensuring data quality and traceability. The aim is to make citizen science data FAIR by design and fully interoperable with EOSC services, such as the EOSC Exchange and EOSC Interoperability Framework. Furthermore, linkage with existing domain-specific infrastructures (e.g. EUDAT, ENVRI-FAIR, ELIXIR) will ensure the sustainability and cross-sector reuse of citizen-generated data, thereby maximising its contribution to scientific research and evidence-based policymaking.

The main non-technical topics we focus on include (but are not limited to):

Strategic Infrastructure Planning

Designing a sustainable and effective Research Infrastructure for Citizen Science (RIECS) requires careful planning beyond technology. The RIECS roadmap (KER4) will set out a clear, multi-year implementation plan covering governance models, financial strategies, and operational procedures. It will ensure that the future infrastructure can be efficiently managed, funded, and scaled. This includes exploring alignment with ESFRI processes, EOSC sustainability models, and Member State commitments. The roadmap serves as a critical tool for decision-makers, helping translate vision into actionable steps and ensuring long-term institutional and financial viability of RIECS.

Impact Assessment and Evaluation Framework

To ensure that RIECS contributes meaningfully to the EU's scientific, societal and policy goals, a robust impact assessment framework (KER5) will be developed. It will allow continuous monitoring of how RIECS affects areas such as scientific excellence, technological innovation, public participation, environmental sustainability, open governance and economic value. The approach combines both quantitative indicators and qualitative insights, in line with EU practices for evaluating Research Infrastructures and

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Open Science initiatives. This will help guide improvement, justify investments, and align with broader frameworks like the Sustainable Development Goals (SDGs) and the Green Deal.

Stakeholder Engagement and Open Governance

RIECS-Concept emphasises inclusive, participatory governance as a key enabler of trust, uptake, and legitimacy. The stakeholder engagement model (KER6) is designed to involve citizens, scientists, policymakers, NGOs, and private sector actors throughout the conceptualisation process. By using tested methods such as Agile User Stories, the project ensures that real user needs define future services and functionalities. This inclusive approach not only supports democratic innovation and co-creation, but also builds ownership and relevance of the infrastructure across communities and sectors. It directly responds to the European Research Area's call for more open and responsive research systems.

Ethics, Privacy, and Data Protection

Given the central role of citizens in data generation and engagement, ethics and privacy are foundational principles in RIECS-Concept. The project is fully compliant with the General Data Protection Regulation (GDPR) and integrates privacy-by-design approaches into all activities. Governance models will be explored to guarantee trusted handling of data, consent procedures, and transparency. Furthermore, the ethical framework will align with Responsible Research and Innovation (RRI) and include specific measures for underrepresented groups, ensuring equity, fairness, and ethical integrity in all future RIECS operations.

Multipliers are typically local, national or international level policymakers, other national and transnational research infrastructures, as well as UN Agencies and International organisations. The engagement of these stakeholders will build on the existing relations and ongoing activities with the CSGP and in addition consortium partners are expected to play an active role by reaching out in their territories.

Generally, the engagement strategy will seek to

- Identify stakeholder needs/Understanding both current and future requirements for using, replicating, or federating with RIECS.
- Identify own solutions & contributions. Obtain insights on software, standards, interfaces, and structural components that umbrella organizations are already developing or plan to develop in the next 10 years in response to RIECS. It also aims to align with the dominant trends common to umbrella organisations in the RI concept

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- Strategic alignment. Ensure that contributions benefit scientific excellence rather than merely improving organizational structures.

- Enable inclusive participation – Facilitate opportunities for all actors to become active contributors to the conceptualisation of RIECS, regardless of their institutional nature, background or expertise. This engagement model is designed to create meaningful dialogue framed by shared objectives and focused on co-developing the project's Key Exploitable Results (KERs).

- Collect lessons learned – Document good practices and reflections shared by participants, with the aim of informing both the design of RIECS and future engagement methodologies.

In the following section, we go into detail about each of the stakeholder groups. These descriptions will help in planning the engagement activities and coordinating the collection and analysis of the data towards project outputs.

3.2.1. Researchers & Scientists

This stakeholder group is composed of researchers and scientists, mostly in academic settings. Their contribution is essential since they have the key to designing experimental campaigns, determining mechanisms for data analysis, and comparing to existing knowledge. I.e. This stakeholder group should put the term *science* within Citizen Science in perspective. RIECS-Concept' goal is to engage researchers in the co-design and later use of the project's outcome (the RIECS platform-to-be).

We target researchers and scientists who already focus on citizen science, predominantly in (but not limited to) the fields of climate change, health and earth observations. At the time of writing, MaU's Sustainable Digitalisation Research Centre counts with a group of researchers addressing health related aspects using CS as one of their methodologies. Our plan is to engage with them, map their network, and reach out to other groups working within the same space in the EU and, possibly, other regions. When it comes to the other fields of study, we will follow a similar idea: for climate change related questions we will depart from MaU's ODOR research group, with experience in visualising climate change as part of projects in developing countries engaging farmers, and for earth observations we plan to pull from Boyd et al.[2]. Our goal is to form a core group of scientists who either show a strong interest or can commit to follow the process, as well as a list of those who see a potential in the idea in the future but do not have the time to closely follow the process. This

[2] Boyd, D. S., Foody, G. M., Brown, C., Mazumdar, S., Marshall, H., & Wardlaw, J. (2022). Citizen science for Earth Observation (Citizens4EO): understanding current use in the UK. International Journal of Remote Sensing, 43(8), 2965–2985. https://doi.org/10.1080/01431161.2022.2076574

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group will include both those who understand CS as a method to advance their work and those who study the field as an emerging scientific and societal phenomenon.

Needs & Opportunities

Follows a list on the subjects we have identified as relevant to researchers and scientists when it comes to CS:

- new opportunities to implement CS as a way to collect and analyse data into their research activities;
- creation of CS datasets that contribute to excellent science, including data validation, curation, aggregation services, and CS data standards;
- open access to viable -whether technically or economically- services and resources;
- access to simplified participant recruitment, through a validated list of volunteers willing to be involved in projects;
- access to institutions, funding bodies, and relevant societal figures that could facilitate the project's execution;
- access to guidance in the ethical and legal aspects of citizen engagement;
- improved in-project communication towards other stakeholders;
- facilitation of the dissemination of scientific results in relevant communities of practice, and other parts of society;
- optimisation of the scientific value of CS through being part of a validated platform;
- guidance, tools and methods for the adoption of CS.

While CS is yet a new field for many researchers, we expect our participants to be aware of the need for a RIECS. However, during our interactions with them, we will provide with examples, success stories, and learnings from other projects to open a call to action where we expect to engage them in the co-design of the RIECS concept platform.

Onboarding & Engagement:

As partly mentioned earlier, we foresee some challenges that could hinder the onboarding of potential stakeholders. We anticipate that there will be a lack of understanding and trust on CS and its standards, as well as a lack of time on the researchers' end. Our plan is to tackle this issue by preparing several tools to help our team highlight the goods of CS through cases as well as the opportunities through speculative examples. We will map networks of relations between research groups and enter in conversations through contacts as a way to minimise the impact of our approach in terms of quality. We plan to first engage in one-to-one communications by means of semi-structured interviews (for which we have recruited a team of master students in design with that expertise) to then design specific workshops where to engage the scientists in co-design activities. I.e. The plan includes a two-steps approach: mapping through interviews, and co-design through workshops.

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Furthermore, we will invite researchers to follow up the project closely through our official communications (website, newsletter, etc.) and will schedule bi-annual one-to-one meetings to give follow-ups to those interested as well as help identify engagement opportunities along the way. We consider the design process to be of evolutionary nature and in the need of monitoring as new opportunities might emerge at the participants' side during the full duration of RIECS concept.

The **key messages** used in onboarding this group will be:

- the opportunity to be part of a transdisciplinary community dedicated to advancing scientific knowledge with the support of CS;
- the opportunity to play a pivotal role in shaping the direction, impact, and scientific ambition of RIECS— driving excellence in citizen science through the co-design of an interdisciplinary and future-oriented research infrastructure. This includes inspiring and mentoring new generations of researchers to see society not just as a subject of research, but as an integral part of the scientific process— unlocking new questions, creative approaches, and transformative insights for global challenges;
- the opportunity to engage with technological development -at conceptual level during the first half of the project, prototypical level during the second- to support citizen participation;
- the opportunity to address policy makers -at national and international level- about the relevance of research questions and have a direct path for knowledge creation and dissemination;
- the possibility of dissemination of complex questions, and reaching out to citizens empowering them in their political perspectives (e.g. improved understanding of climate change supports informed decision-making);
- the possibility of participating in the process beyond their research personas, by bringing in their institutions, colleagues, and students, thus indirectly participating in the project's dissemination.

The engagement will address **topics** such as:

- data/metadata, their relevance, types, current collection and labelling strategies, etc;
- privacy, accessibility, and compliance: current techniques and anticipation for future regulatory and technical aspects;
- region-specific ethical and regulatory concerns;
- current hurdles in the process of setting projects at technical level, which platforms and infrastructures are currently in use, challenges with those, legal limitations, etc;
- current hurdles in citizen engagement, the types of groups they are [not] addressing and the reasons behind those choices, the institutional aspect, researcher credibility, etc;

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- stakeholder fatigue, are there specific citizen groups who are hard to engage because of the abundance of previous projects;
- creation of longitudinal focus groups, long term engagement with stakeholders, addressing their needs and maintaining engagement.

As mentioned above, the interaction with this stakeholder group will have two different **formats**:

- Semi-structured Interviews

We expect to conduct a series of interviews, estimated to be 60, in order to recruit a group large enough to participate in the subsequent co-design workshop series. We estimate that, given the complexities within the stakeholder group, it is very likely that many stakeholders will not have the time to participate in longer engagements. We have recruited a team of master students who will help with the communication and data collection throughout the interviews. We expect to have most of these to happen online in order to cover as many countries as possible.

Semi-structured interviews are a common design tool where the researcher will follow a pre-established protocol of questions leading towards having an open discussion about the topic at hand. This is a common qualitative research method. In our case, the purpose of semi-structured interviews is to have a foundation that ensures the minimum input needed by the partner without being too prescriptive and allowing the participants to speculate on the visions, and possible functionalities and services of the RIECS technical platform to-be.

- Workshops

We expect to conduct in-depth co-design workshops with a selected group of the interviewed stakeholders. There are two phases in this process, and we expect to engage the participants reaching this moment of the process to participate in two workshops. In the first phase workshops we will look at a series of speculative scenarios based on the outcome of the interviews and existing literature. The aim will be to co-design strategies for how the different parts of a CS workflow could take place, times to engage different stakeholders, and the kind of patterns that could emerge from the cases as well as their reusability. The second phase workshops will be focused on technologies needed to fulfill the kind of vision traced during the first workshop. We anticipate discussion about data collection technologies, software and hardware tools, information storage, and Ux of different processes.

Workshops are one of the most used design methods and imply having a group of people following a protocol together in order to address certain issues, research questions, etc. Workshops require a certain degree of orchestration and planning, and can involve heterogeneous or homogeneous groups of people. In our case, all participants will be researchers -thus homogeneous, and workshops will be repeated once in each phase.

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The following table describes the above-mentioned process in the form of a timeline, we consider the interviews to be part of the first phase of this work.

Phase 1	Phase 2
• 60 interviews with researchers, 20 for each field. Eventually more if we didn't reach the goal of recruiting for the workshops. • 2 Online Workshops 15 participants each from 10+ European countries at least 10 of them researching climate change, health, and environmental observations	• 2 Online Workshops 15 participants each from 10+ European countries at least 10 of them researching climate change, health, and environmental observations

Table 1 – Overview number of activities with Researchers & Scientists

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D2.1 Challenges assessment
- D4.3 Stakeholders' requirements report
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)
- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: MAU.

3.2.2. Citizen Science Networks

This stakeholder group includes national, international and global CS umbrella associations - organised groups of institutions, practitioners, and stakeholders working together at different levels. Within these organisations, there are typically two layers of stakeholders - the umbrella organisations and the members of the umbrella organisations. For RIECS-Concept, the strategy focuses on engaging with the members of these umbrellas

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(direct users of the RI) rather than the umbrella organizations themselves, who will serve more as geographical representatives, proxies, and multipliers for a broader outreach.

Examples of **global umbrella organisations** whose members we plan to engage include CSGP and ECSA (already part of the consortium), AAPS (USA), ACSA (Australia), RICAP (Latin America), CitSci Africa, CitizenScience.Asia.

National networks to be engaged for broader geographic coverage, such as Spain Ibercivis and Ciencia Ciudadana, Austria's Citizen Science Network, Netherlands, Germany, Denmark, Belgium, France, Sweden, Brazil (Cívis - Plataforma de Ciencia Ciudadana), Chile, Italy's Citizen Science Network, Slovenia's Network, Lithuanian Citizen Science association.

Local initiatives: Zurich's Citizen Science Centre, Vilnius Tech's Citizen Science Hub, Andalucia's Descubre Foundation, Barcelona's Citizen Science Office.

CS associations around the world focused on S&T domains related to RIECS to be contacted include: ENoLL (European Network of Living Labs), Earthwatch Europe. GLOBE Program (Global Learning and Observations to Benefit the Environment), CitSci.org, SciStarter, eBird, Biodiversa+, *iNaturalist*, *Zooniverse* and *Observation.org*

Other associated initiatives to be considered as part of this SH group include:

- Copernicus (European Earth Observation Programme) Implemented by ESA and EUMETSAT, and coordinated by the European Commission.
- European Environment Agency (EEA) Projects in biodiversity, air quality, climate change, and more.
- LifeWatch ERIC
- ENVRI-FAIR / ENVRI-Community
- European Health Data Space (EHDS)
- One Health European Joint Programme (OHEJP)
- CDC (European Centre for Disease Prevention and Control)
- European Climate Research Alliance (ECRA)
- EU Mission: Adaptation to Climate Change
- ECDC (European Centre for Disease Prevention and Control)
- Coalition for Advancing Research Assessment (CoARA)

Moreover, beyond combining principles of co-design and shared ownership that ensures both scientific and societal needs are represented in decision-making processes, the governance model for RIECS is intended to be open, flexible, and scalable, and allow for both formal and informal integration of CS networks, organisations, and key actors **over time**.

RIECS-Concept will enable the evolution of the consortium, facilitating the inclusion of new parties, alliances and collaborations in response to emerging challenges and possibilities.

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MoU, new initiatives related with funding opportunities., and future joint initiatives with other regions or thematic areas will be continuously explored. This approach ensures that RIECS is not a closed structure but rather a dynamic infrastructure, capable of adapting and growing alongside citizen science communities, fostering transcontinental and cross-sector cooperation that enhances its scientific and societal impact.

Needs & Opportunities:

This stakeholder group's interest in citizen science is down to specific needs the group has. Thus far, we identified the need for:

- Mechanisms to support CS excellence, including quality standards, validation protocols, and evaluation frameworks that ensure scientific rigor and credibility of CS initiatives.
- An open platform/forum for mutual learning and exchange of experiences. A dedicated space to foster dialogue, share lessons learned, and promote best practices among CS practitioners, enhancing collaboration across regions and domains.
- Shared tools, services, and resources to support CS deployment: Accessible infrastructure for project management, data collection, analysis, visualization, and reporting to facilitate the successful implementation of CS initiatives.
- Frameworks to scale CS efforts across countries: Structures that enable the replication, adaptation, and expansion of successful CS projects beyond local or national boundaries, supporting a cohesive European and global CS ecosystem.
- Support for the collection and validation of high-quality data: Including mechanisms for ensuring data reliability and credibility, aligned with scientific and policy needs.
- Common data standards and interoperability mechanisms: Ensuring that data from diverse CS initiatives can be integrated, shared, and reused across platforms, disciplines, and countries, amplifying their scientific and societal impact.
- Integrated, unified protocols and or technologies for scalable CS applications: Enabling seamless connectivity between CS platforms, tools, and databases, supporting scalable and sustainable participatory research.

With such a wide range of needs this stakeholder group is expected to be aware of the need for a RIECS. Boosting their motivation to engage in the co-design of the concept will be done by reiterating the needs and potential uses of RIECS for CS networks and their members.

Onboarding & Engagement:

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At the same time, the onboarding and engagement strategy must acknowledge and address from the very beginning, not only the needs, but equally the **potential challenges** of engaging this stakeholder group, such as:

- Engaging members directly.
- The wide range of members and potentially competing interests.
- Diverse Strategic Agendas and Priorities. Many networks have their own strategic goals, operational timelines, and funding constraints. Aligning RIECS engagement efforts with their internal agendas requires flexibility and coordination. Example: CSGP may prioritise SDG impact, while ECSA may focus on local-scale education or biodiversity monitoring.
- Uneven Institutional Maturity and Capacity. While some networks (e.g. ECSA, CitSci.org) are mature and professionally staffed, others are volunteer-driven or emerging, limiting their ability to engage deeply or sustain collaboration.
- Geographic, Cultural and Linguistic Barriers. Regional differences can impact the accessibility and inclusiveness of engagement activities. Example: Engagement in non-English speaking countries must consider multilingual materials and culturally relevant participation models with clear benefits for non-European countries. Certain geographical areas and stakeholder groups may be underrepresented in international CS dialogues and may require specific outreach strategies.
- Coordination Across Scales and Levels. Harmonising engagement with global, national, and local CS actors is challenging. Networks may lack mechanisms or capacity for multi-level coordination.
- Perception of Redundancy or Competition. Some networks may perceive RIECS as overlapping with or duplicating their existing solution or competing against existing platforms or mandates, rather than complementing them.
- Fragmentation in Thematic Focus: Thematic networks often operate in silos— biodiversity, health, education, etc. —— with limited cross-domain collaboration. RIECS, being cross-cutting, must bridge these silos for a coherent engagement approach.
- Lack of Incentives for Participation. Engagement without immediate funding or policy outcomes may not be prioritised. Networks need clear value propositions, such as visibility, influence in roadmap development, or future service access.
- Trust and Governance Concerns. Questions around who governs the RIECS process, how decisions are made, and how CS networks will retain influence may hinder early commitment.
- Engagement Fatigue. Particularly for highly active networks (e.g. eBird, Zooniverse), frequent invitations to EU projects without follow-up or clear outcomes can cause disengagement or scepticism.

The key messages used in onboarding and engagement strategies will need to demonstrate a good understanding of the needs and potential barriers to engaging this SH group. This engagement model will evolve over time.

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One key strategy will be to involve the different umbrella organisations at different stages of the project - sharing the knowledge gathered at each moment in order to show how previous input has been translated into different components of the concept, in a manner that does not influence the stakeholders and limit their creativity, but that shows that their input is being taken into account.

The **key messages** used in onboarding this group will be:

- The opportunity to support the conceptualisation for a RI centred CS, driving collaborative innovation.
- The opportunity to help us identify current CS challenges and explore collaborative solutions to overcome them.
- The opportunity to foster collective knowledge and experiences to advance scientific research and decision-making processes.

The engagement will try to address **topics** like:

- governance models
- data & interoperability best practices
- technological infrastructure, scalability, modularity and compatibility,
- training programs
- regulatory and ethical issues, organizational aspects
- alignment with policy and research agendas
- exploring global/local synergies
- innovation and knowledge valorization
- emerging technologies (AI, blockchain, IoT) and their relevance for CS
- scenario planning for the evolution of CS infrastructures over the next decade

The engagement will have different **formats**:

- Conferences & Networking Events.

These gatherings are crucial touchpoints for building trust, aligning strategies, and ensuring that RIECS remains responsive and inclusive as it develops.

  - CAPS 2025 conference in Portland, which offers a unique opportunity to engage directly with key citizen science networks, platforms, and practitioners from the Americas and beyond. RIECS-Concept oganizes a symposium (May 2025) which provides an opportunity to engage with major CS platforms and AAPS across American and global networks.
  - The Citizen Science Summit in Austria at the Ars Electronica Festival 2026.
  - ECSA 2026 Conference in Finland.

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- Through CSGP.

- Joint funding opportunities
  - Europe-Latin America funding calls are currently being explored to expand the consortium.
  - Joint initiatives will be organized with umbrella institutions, leveraging events like the ECSA 2026 Conference to facilitate collaboration with Australian and African organizations.

- Workshops

Phase 1	Phase 2
• 2 Online Workshops all relevant EU & beyond CS umbrella organisations, and ideally all national umbrella organisations	• 2 Online Workshops all relevant EU & beyond CS umbrella organisations, and ideally all national umbrella organisations

Table 2 – Overview number of activities with Citizen Science Networks

As part of a collaborative and iterative methodology, we plan to engage participants before, during, and after each interaction with other CS networks (e.g. joint events), ensuring that stakeholders' experiences and priorities feed directly into the RIECS conceptualisation. Core elements of the onboarding and engagement approach include:

- Pre-event collaboration, discussions:
  - RIECS-Concept shares its current knowledge base, main insights and concept sketch.
  - CS networks share experiences (via structured templates or unstructured conversations) focusing on lessons learned, challenges, infrastructure needs, and future priorities.

- Participatory design session. The event itself may use dynamic facilitation methods (e.g., breakout groups, visual mapping, guided reflection) to enable open dialogue around key questions such as:
  - *What services, resources, and functionalities should the future RI provide?*
  - *What governance and sustainability models can ensure long-term alignment with CS networks?*
  - *How can RIECS strengthen interoperability and mutual learning across infrastructures?*

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- Outcomes-driven process. The event will prioritise actionable outputs, including:
  - Mapping challenges and lessons learned across infrastructures.
  - Co-creating a shared agenda or roadmap for action to shape RIECS
  - Contributing to an open-access synthesis publication to document findings, which feeds directly into RIECS-Concept outputs like the Stakeholders' Requirements Report.

- Continuous feedback loops: Post-session, RIECS-Concept will sustain engagement through ongoing virtual and in-person exchanges (e.g., ECSA 2026 Conference) to integrate new insights, maintain momentum, and evolve the engagement strategy over time.

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D2.1 Challenges assessment (optional).
- D4.3 Stakeholders' requirements report.
- D5.1 Outcome documentation of CS stakeholder summit.

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2).
- Preliminary catalogue of services, resources and functionalities (D2.3).
- Organisational challenges (D3.1).
- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: IBE.

3.2.3. NGOs

NGOs — broadly understood as entities driven by the public good — play a crucial role in mobilising communities, raising awareness, advocating for systemic change, and implementing solutions to societal challenges such as climate change and public health. Biodiversity loss and environmental degradation are both addressed under the umbrella term "environment" in this project.

In the context of RIECS concept, we will not only engage NGOs in the strict or traditional sense, but also with a range of other actors that operate with a civic mandate to advance environmental, social, and scientific goals in the public interest. This will include mission-driven foundations, nonprofit infrastructures, open-source technology stewards,

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community-based alliances, and civic oriented funding agencies that align with democratic and participatory values, as well as civil society organisations where and if relevant. We will make sure to have good representativity of organisations, also within the use cases of the project, e.g. climate change, health, environmental/biodiversity observations.

Organizations to include within this ecosystem are grouped as follows (some examples are given):

- **Traditional NGOs and Advocacy Organizations**
  - European Environmental Bureau (EEB)
  - Open Knowledge Foundation Germany
  - VA (Public & Science), Sweden
  - FERN, Netherlands
- **Nonprofit Infrastructures and Open Technology Stewards**
  - Linux Foundation Europe
  - European Open Source Academy
- **Policy-Linked Civic Innovation Initiatives**
  - Lancet Countdown
- **Community-Based or Grassroots Alliances**
  - Chaos Computer Club
- **Civic-Oriented Funding Agencies**
  - Mozilla Foundation
  - Next Generation Internet (NGI) Initiative
  - Sovereign Tech Fund

These organizations collectively represent diverse but complementary roles in shaping civic participation, responsible technology use, public-interest data governance, and ethical interdisciplinary collaboration — all of which are foundational to the long-term vision of the RIECS concept.

ECSA's engagement approach actively seeks to collaborate with such actors, recognizing their ability to convene diverse publics, amplify underrepresented voices, and foster interdisciplinary dialogue. Due to their civic purpose, these organizations are uniquely positioned to conduct necessary interdisciplinary interaction with other NGO-like entities. Building bridges between them will be a central task — enabling mutual understanding, collective learning, and long-term partnerships. Through interviews, co-creation workshops and targeted outreach, we aim to support these actors not only as participants, but as co-shapers of the citizen science ecosystem capable of addressing complex, cross-cutting societal challenges.

ECSA also plays a central role in facilitating interactions among these actors that go beyond project timelines — aiming to foster long-lasting collaborations and lay the foundation for economic and operational sustainability in line with the long-term vision of the

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RIECS-concept. This includes supporting the emergence of enduring knowledge partnerships, shared infrastructures, and collaborative pathways that can sustain citizen science ecosystems well beyond the project's lifecycle.

Needs & Opportunities:

This stakeholder group's interest in citizen science is related to specific needs the group has. Thus far, we identified the **need** for:

- Access to citizen science methodologies and applied knowledge to support awareness-raising and evidence-informed advocacy on urgent societal challenges.
- Identification of local opportunities where citizen science can be used by the organization's members to strengthen community participation and address (local) context-specific issues.
- Bridging tools and frameworks that connect local initiatives with interdisciplinary civic actors — including open-source technology communities, education systems, SMEs, policy-makers, and EU research infrastructures — to promote inclusive co-creation.
- Introduction to methodological and technical support that can enable meaningful, long-term societal engagement and help scale up the impact of community-driven actions.
- Support in identifying and accessing relevant funding bodies to help close the funding gap, particularly for community-driven technological needs and grassroots innovation.
- Matchmaking mechanisms that align local problems with ethical, context-sensitive technical solutions — including access to transparent, community-aligned technologies and open innovation infrastructures.
- Opportunities to engage in the civic governance of technology, ensuring that digital solutions and scientific infrastructures evolve in line with societal values, inclusion, and environmental justice.

ECSA's role spans from nurturing bottom-up local initiatives to identifying "local" opportunities — where citizen science projects inspire broader knowledge production, product development, policy uptake, and sustainable fundraising strategies.

By interlinking civic engagement, scientific rigor, and cross-sectoral innovation, ECSA aims to ensure that RIECS is not just a framework but a living ecosystem of co-created knowledge and long-term impact.

Onboarding & Engagement:

The onboarding and engagement strategy for NGOs, foundations, and other civic-purpose actors must go beyond inclusion — it must be designed to position their ownership a

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active leaders in their relevant role and their point of contact with RIECS, promote interdisciplinary collaboration, and embed their knowledge and capacities into the RIECS ecosystem from the outset.

The onboarding and engagement strategy will address both the needs (see above) and potential challenges of involving this stakeholder group from the outset. Potential **challenges** include:

- Limited Time and Resources: NGOs often operate with tight budgets and small teams, making it difficult to commit time and staff to lengthy co-design processes.
- Different Priorities and Mandates: NGOs may focus on advocacy, service delivery, or local engagement —— goals that may not always align with academic or infrastructure-focused agendas.
- Varied Levels of Technical Expertise: Some NGOs may lack familiarity with research infrastructure, data management standards, or the technical aspects of citizen science platforms.
- Diverse Contexts and Needs: NGOs vary widely in size, mission, and geography, so a one-size-fits-all infrastructure may not suit all, making inclusive design more complex.
- Communication Gaps: Differences in language, jargon (e.g. "research infrastructure") can lead to misunderstandings or misaligned expectations.
- Uncertainty About Long-Term Benefits: NGOs may question how the infrastructure will support their mission or whether their involvement will produce tangible results for their communities.

The **key messages** used in onboarding this group will be:

- Shape how citizen science serves your mission. Join the co-design of a civic-centered infrastructure that empowers NGOs and civic actors to address societal challenges through evidence, participation, and innovation.
- Bridge local needs with ethical, scalable solutions. Gain access to a platform that helps match community-driven issues with responsible technologies, funding pathways, and interdisciplinary collaborations.
- Amplify your voice in research and policy. Contribute your organization's insights, data, and values to influence scientific research agendas and decision-making processes at local and European levels.
- Connect across silos to build lasting impact. Be part of a network that fosters shared infrastructure, mutual learning, and long-term partnerships among NGOs, tech actors, education systems, and research institutions.
- Access tools and knowledge to scale your efforts. Use RIECS as a vehicle to strengthen your outreach, deepen your engagement methods, and improve the visibility and impact of your citizen science initiatives.

The engagement will address **topics** like:

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- Data and metadata use – Including citizen-generated data validation, aggregation standards, and formats suitable for advocacy, open access, and reuse.
- Privacy, accessibility, and legal compliance – Ensuring that civic actors have clarity on GDPR, licensing, and ethical considerations when handling citizen science data or engaging communities.
- Ethical use and governance of technology – Addressing how open-source tools, platforms, and infrastructures can be used responsibly, and how NGOs can shape ethical tech standards through civic participation.
- Interdisciplinary collaboration models – Exploring how NGOs, tech stewards, educators, researchers, and policymakers can jointly define shared problems and design coordinated responses.
- Sustainability and funding mechanisms – Identifying funding pathways for local innovation, open infrastructure maintenance, and long-term civic involvement in research infrastructures.
- Community participation strategies – Developing approaches for inclusive recruitment, long-term engagement, and the empowerment of underrepresented or vulnerable communities.
- Transparency and influence in policy processes – Understanding how citizen science results and civic data can feed into decision-making, policy proposals, or advocacy campaigns.

The engagement will involve multiple formats and events:

To ensure diverse and sustained participation of NGOs and civic ecosystem actors, RIECS will implement a multi-format engagement strategy. These formats are tailored to enable both structured input and dynamic collaboration, while building trust and ownership over time:

- **ECSA Infrastructures:**
    - Biennial conferences

ECSA's biennial conference brings together researchers, practitioners, and civil society actors from across the world and well serve as a core venue for engaging selected SHs, sharing RIECS updates, collecting feedback and sharing project findings.

    - Working groups

ECSA's working groups are one of the core offerings of the association. It will serve as consistent engagement nodes especially when it comes to strengthening civic engagement with academic activities to promote excellence in scientific research through NGOs and NGO-like stakeholders can help shape methodologies to contribute to transversal topics.

    - Regular online networking events

Quarterly online meetups will be also used for informal check-ins, rapid consultations and fostering interdisciplinarity and transnational connections among civic actors, tech stewards, and researchers in the RIECS-network.

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- Community Communication Channels

ECSA's newsletters, together with RIECS SH newsletters and mailing lists and blogs will keep stakeholders informed and engaged at key stages of the project.

- **Conferences & Networking events:**

ECSA aims to engage at all relevant opportunities with this SH group, examples are:

- CS4Health annual conference

As a sister community of ECSA, the CS4Health conference will be a strategic event to engage with NGOs working at the intersection of citizen science and health, enabling health-focused civic actors to explore how RIECS support their mission.

- AAPS annual conference
- Regional studies association annual conference

The RSA conference will serve as a key engagement point to interact with NGOs, policymakers, and civil society actors to exchange on society and governance aspects of citizen science. It provides a space to explore non-technical requirements such as regional inequalities, place-based engagement strategies, and the integration of citizen science into territorial development fundings and policies.

- Chaos Computer Club (CCC) annual congress

The CCC Congress is an opportunity not only for technical tools exchange but also a rich space for discussing non-technical requirements, especially topics related to (1) Digital Ethics and Data Justice (2) Privacy, surveillance, civic autonomy (3)Transparency and accountability in tech infrastructure (4) Citizen rights in digital governance (5) Critical tech activism and alternative governance models that fits to local practices.

- **Semi-structured Interviews:**

This is a frequently used semi-qualitative method where a pre-established protocol of questions will be designed to have consistent information collected across the interviewees, this will then be concluded by an open discussion about the topic and specific additional questions that may have arisen during the interview. The open phase will also allow for speculations, visions, ideas out of the box to be gathered.

- **Surveys:**

Results from the semi-structured interviews and the first workshops will be used to design a survey for the larger network of NGOs identified and for organisations explicitly wishing to participate in RIECS co-design but without sufficient capacity for workshops. The survey will cover key topics such as infrastructure needs, barriers to participation, governance and ownership models, and equity and access issues, using a mix of quantitative and open-ended questions. Key NGO partners will be invited to act as amplifiers

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- **Workshops**

Phase 1	Phase 2
• 25 Interviews to understand needs and challenges from Civic ecosystems (5 from each category). • 2 Online Workshops 15 participants from 10+ European countries	• 2 Online Workshops 15 participants from 10+ European countries

Table 3 – Overview number of activities with NGOs

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D2.1 Challenges assessment (optional)
- D4.3 Stakeholders' requirements report
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)
- Findings on RI non-technical requirements (D3.2)
- Roadmap and implementation strategy (D3.4)

which will all contribute to the final RIECS concept.

Stakeholder group steward: ECSA.

3.2.4. Technology Providers

Technology providers or existing infrastructures (platforms, tools, services, facilities) are part of the managers, hosts and providers of infrastructure services to the citizen science community. They are a fundamental pillar of RIECS as potential nodes, beneficiaries of services, or allies in providing services. Their involvement is crucial as they can provide understanding and assessment of already available services, tools and platforms, and would also give the consortium valuable knowledge of the possibilities for expansion and adaptation of existing tools and platforms that can contribute to the RIECS catalogue of services, resources and functionalities.

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Infrastructure providers can be categorized in a preliminary approach as specialized infrastructures for citizen science and cross-platforms that provide or include services to citizen science communities and projects and other communities. Within the specialized infrastructures for citizen science in Europe, one approach will be to identify the citizen science platforms that exist following the purposes they pursue. Also, there are platforms that serve at European, regional, national and local levels, and platforms that serve specific domain-oriented areas such as oceans and marine, health, and earth observation. Below is an initial list of some of these platforms that are hosted in Europe but do not necessarily provide services only within the European area. Considering RIECS as a pan-European infrastructure, the United Kingdom is included within this preliminary overview.

Project discovery platforms enable individuals to find and connect with citizen science projects that match their interests and location: EU-Citizen.Science.

Resource collection platforms (knowledge hubs) serve as central repositories providing tools, training materials, and best practices for citizen science communities: WeObserve.

Insight platforms analyze and interpret citizen science trends to bridge theory and practice through strategic insights: Observatorio de ciencia ciudadana de España, MICS.

Onsite data collection platforms facilitate real-time data gathering and management through mobile apps and web interfaces in specific areas. This category includes hundreds of platforms developed in Europe. Below is a sample of some of them, provided for illustrative purposes only and not as a basis for reliance or prioritization. Biodiversity: Observation.org, ArtPortalen, iSpot, MINKA. Litter, microplastics: Debristrackers, Surf for Science, Plastic Pirates. Water: eyeonwater, riu.net Air quality: hackair Environmental health: Mosquito Alert.

Online data entry platforms enable collaborative online analysis and categorization of diverse data sources through community participation: Zooniverse (if we consider that it is hosted by an alliance that includes UK based universities).

Enhanced learning platforms use gamification, interactive technologies, and machine learning to create engaging educational citizen science experiences: The Open University citizen science platforms, Pl@ntNet

Needs & opportunities

This stakeholder group represents a set of inputs and opportunities for RIECS that we identified as:

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- Many citizen science platforms and tools are already well-established with active user communities that have been building for years, providing RIECS immediate access to proven technologies, datasets, and engaged volunteer networks.
- Building upon these existing infrastructures accelerates RIECS development while respecting established networks and practices, highlighting continuity and growth rather than starting from scratch.
- Technology providers at the forefront of innovation create a conduit for knowledge exchange, ensuring cutting-edge capabilities (from AI-driven data validation to new mobile sensing techniques) become available to all RIECS users.
- Their insight helps identify gaps in the current tool landscape and inspires collaborative development of new solutions that align with open science goals.
- RIECS serves as a unifying framework promoting interoperability among diverse citizen science tools through common data and metadata standards following FAIR principles
- Working together on standards compliance and shared APIs creates an "information supply chain" where data flows seamlessly from volunteer collection to research and policy use.
- Integration into European research infrastructure context elevates platform profiles and provides institutional support, opening doors for sustained funding and policy recognition.
- Supports EU Commission's goal of a more inclusive European Research Area by connecting citizen-generated data with mainstream research infrastructure and addressing strategic priorities like the Green Deal.
- Transforms short-term projects into long-term data resources with enhanced legacy and impact through recognized policy channels.

This stakeholder group's interest in citizen science responds to specific needs. Thus far, we identified the **need** for:

- a transdisciplinary space that brings together infrastructures from multiple domains (e.g., climate, health, environment) to create exchange of knowledge, services and lessons learned
- a facilitator that promotes synergies among existing platforms, tools, services and infrastructures based on a mapping of strengths and available platforms, services, tools and in general infrastructures available in citizen science that can create synergies within these platforms
- a set of services that addresses interoperability among platforms within the same domain but also across domains
- an instance that works in the development of standards, especially in areas with less development of general standardizations like environmental quality (air quality)
- a space that recognizes existing services, tools and platforms and elevate them as part of the infrastructure for citizen science

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- a strategy for development and sustainability that generates collective models to maintain services, platforms, tools and facilities
- a collaborative space where infrastructure providers can explore and share best practices on environmental-friendly technologies and reducing environmental footprint

Onboarding & engagement

At the same time, the onboarding and engagement strategy acknowledges potential **challenges** in engaging this stakeholder group, such as:

- competitive approach, considering RIECS as an initiative that will try to replace totally or partially their services without acknowledging the process
- the centralization of infrastructures in citizen science, monopolizing resources or visibility could create resistance
- the legitimacy of the group behind RIECS and their capacity to understand the complexity of infrastructures and to run the necessary synergies among these diverse domains: climate, environment and health
- the inadequate feeling of "small" infrastructures in a context of a very advanced organization with huge infrastructures
- the diversity of intellectual properties and models of each platform, including those that provide exclusively services as business for citizen science
- not being recognized as part of research infrastructures, creating elites of infrastructures
- focusing RIECS on high-tech technologies and leaving out of scope low-tech, bottom-up technologies, or technologies focused on AI that leave some of the existing infrastructures out of the picture
- ensuring a model of governance and participation that ensures transparency but at the same time focuses and moves forward the infrastructure

The **key messages** used in onboarding this group will be:

- the opportunity to share your vision of a new research infrastructure with society at its core, and give input on the services that should be provided
- being involved since the beginning in a long journey to consolidate a research infrastructure for citizen science
- your experience as infrastructure counts and is valuable and recognized
- the opportunity to gain insights into the diverse needs of stakeholders for the development of an innovative research infrastructure
- the opportunity to explore new potential synergies among technologies and business models to be used in citizen science

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- not overpromising regarding the infrastructure, being clear about the process of construction and how it will be addressed by stages that depend on many factors, but at the same time recognizing the role they can have within it

The engagement will try to address **topics** like:

- Interoperability
- Data harmonization
- Standards for domains, especially like climate and environmental variables
- GDPR compliance among European countries in points where there is discrepancy
- Data/metadata
- Privacy, accessibility and compliance
- Technological infrastructure, scalability, modularity and compatibility
- Innovation and knowledge valorization
- Emerging technologies (AI, blockchain, IoT) and their relevance for citizen science

The engagement will be constant throughout the project, involving multiple formats, although two phases will be clearly identified as described in the workshop's description. Communication actions to engage stakeholders will be supported by Vilnius Tech partner and communication project channels.

Conferences & networking events:

- Citizen science conferences: during the Citizen Science Conference of Association for Advancing Participatory Science (AAPS) conference in May 2025 in Oregon, the European Citizen Science conference in Finland in March 2026, the Citizen Science for Health conference in Zurich in November, the Open Science Fair in Geneva. And others planned to attend that will provide spaces to meet the managers, coordinators, developers and users of technologies in citizen science.

Working groups:

- Participation within the associations of citizen science as well as European projects. There are working groups that have been running in some cases for years addressing topics related to standards, citizen science technologies, and interoperability. Within RIECS it will be key to develop relationships with those working groups like: Data and Metadata Working Group of AAPS, Projects, data, tools and technology of ECSA, Data and metadata working group of ACSA. Additionally, specific working groups under development that need to be considered include the one in process by the Citizen Science Global Partnership to start conceptualizing a platform that integrates multiple sources of data and provides real-time data to organizations like the United Nations Environmental Program, specifically the World Environmental Situation Room (WESR) data room.

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- Also from projects like CROPS (Curating, Replicating, Orchestrating, and Propagating Citizen Science across Europe) working group, WeObserve working group for citizen observatories.
- The LIBER citizen science group from LIBER, the Association of European Research Libraries will also be an actor to involve considering libraries as part of the infrastructures for citizen science and their role in some cases of CRIS as research information systems that involve citizen science data.

Infrastructure networks:

- Networks such as Gathering for Open Science Hardware (GOSH) and their regional groups like GOSHers from Europe will be key to engage to understand multiple perspectives of the infrastructure for citizen science. Also the network of Fab Labs FabLabNet: Central European network of innovative and creative labs that will address infrastructures. AI4EOSC (IFCA-CSIC) provides resources to develop, train and use AI models in a federated platform. QGIS community: QGIS is developed by a team of dedicated volunteers and organizations. Pyladies: provide a friendly support network for women and a bridge to the larger Python world. Rladies: same as the above, but for R programming language.

Interviews:

- Semi-structured interviews will be performed in different spaces, during conferences. Booking one-to-one meetings with key experts to dive into some experiences about platforms or topics. The interviews will be organized according to the development and priorities of the project. Actors from the previous groups will be part of the interviews as well as key organizations such as the Joint Research Center of the European Commission and specialists working on citizen science.

Workshops:

- During phase 1 collection of inputs, creation of scenarios and testing ideas, two workshops will be held in alliance with the networks and working groups previously mentioned to optimize synergies. Also as part of the user stories and prioritization of services by the infrastructures.
- During phase 2 validation of outputs by RIECS as part of the conceptualization, evaluation of scenarios and defining roadmaps, another set of workshops will be held.

Phase 1	Phase 2
• 2 Online Workshops	• 2 Online Workshops

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15 participants from 10+ European countries	15 participants from 10+ European countries

Table 4 – Overview number of activities with Technology Providers

Note: During phase 1 and phase 2 multiple actions are foreseen for engaging diverse infrastructure actors. Including conferences, networking events, interviews and one to one meetings.

The results of this engagement actions will be assessed, and the engagement activities will be documented in the following reports:

- D2.1 Challenges assessment
- D4.3 Stakeholders' requirements report
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)
- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: CSIC.

3.2.5. Companies

This stakeholder group will include private companies in different fields of activity, operating across various sectors, such as environmental consulting, information and communication technologies (ICT), data analytics, artificial intelligence, biotechnology, health services, pharmaceuticals, urban planning, civil engineering, energy (including renewable energy), transportation and mobility, waste management, water services, agriculture and food systems, forestry, tourism, education technology, and media and communications. Etc.

The private sector is a widely diverse sector in which we cannot use a one-size-fits-all approach. To make things easier in the beginning, we will seek a general starting point for the discussions with the private sector, followed by a deep dive into the specific needs of companies in different sectors.

Thus, we will begin by exploring entry points that align with companies' interests and capacities — such as innovation or social responsibility — to better understand how to

in science can bring value across sectors. This will help us identify relevant use cases,

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strengthen communication, and build broader recognition of citizen science as a credible and useful research and development approach. Ultimately, the discussions also aim to make a wider case for CS excellence and build recognition for it as a research methodology. Ultimately, the discussions also aim to make a wider case for CS excellence and build recognition for it as a research methodology.

Needs & Opportunities:

This stakeholder group's interest in citizen science stems from its specific needs which vary significantly from country to country. Identifying a unified set of needs across different national and local contexts will be challenging and our strategy will have to be more adaptive here than in other cases. The needs identified thus far are the **need** for:

- engaging with and benefiting from high-quality research relevant to their fields
- access to new datasets
- community insights for product/service development
- reputational gains tied to social responsibility

Creating an awareness of these needs and potential benefits will drive our engagement strategy with the private sector.

Onboarding & Engagement:

At the same time, the onboarding and engagement strategy must acknowledge and address from the very beginning, not only the needs, but equally the potential **challenges** of engaging this stakeholder group, such as:

- lack of familiarity with CS overall (particularly, in some contexts)
- perception of CS as a competing field (due to its open-source nature)
- lack of internal capacity to engage with CS
- lack of prior experience in cross-sector collaboration involving academic, civic, and policy actors
- misalignment between citizen science timelines and commercial project cycles or delivery pressures
- limited visibility of citizen science within corporate innovation or sustainability agendas
- reluctance to engage in initiatives where governance structures, accountability mechanisms, or risk management procedures are unclear or underdeveloped
- different departments or decision-makers within a company may not be aligned, making it difficult to approve or coordinate participation in citizen science projects
- limited perception of how citizen science can contribute to business outcomes or strategic priorities.

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Identifying and responding to these factors is essential for building trust, clarifying expectations, and creating entry points that resonate with private-sector priorities.

Due to the different maturity levels across various countries of this particular SH group, the onboarding and engagement strategies should be responsive and embedded in local dynamics.

The **key messages** used in onboarding this group will be:

- The opportunity to gain insights into the diverse needs of stakeholders for the development of an innovative RI
- The opportunity to explore new potential technologies and business models to be used in CS
- The opportunity to share your vision of a new RI with society at its core, and give input on the services that should be provided
- Access a unique pool of talent and future collaborators
- Position yourself as a leader in responsible and open innovation
- Gain early access to strategic insights and roadmaps
- Shape a more sovereign and inclusive digital future

The goals of the engagement will also have to be adapted to different contexts, from:

- exposure to CS in contexts with low maturity, framing CS as a resource rather than a competitor and highlighting its benefits for business
- co-developing small-scale pilots (or phases of projects) in contexts with moderate maturity
- active co-creation in mature contexts where stakeholders have had previous engagement

The engagement will try to address **topics** like:

- citizen-generated data
- community trust
- scalable business models
- quality assurance and validation processes
- integration of citizen science into existing innovation pipelines
- reputational benefits and risks
- opportunities for public-private collaboration in research and development
- data ownership and access rights
- compliance with data protection and sector-specific regulations
- alignment with legal and ethical standards in data use and public engagement

The engagement will have different **formats**:

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- Networking events (low-maturity contexts)

These events will have the role of introducing citizen science to stakeholders, focusing on framing such initiatives as beneficial for R&D, as well as CSR.

- Presentations (low-maturity contexts)

These events will focus on the concrete benefits of partnering, or being involved with CS projects, such as access to trustworthy data, etc.

- 2 Online Workshops (moderate and high maturity contexts)

Examples of good practices how companies could be involved in CS:

Zooniverse (operated by the Citizen Science Alliance) **https://www.zooniverse.org**. While not a traditional "company" in the commercial sense, Zooniverse is a leading platform supported by academic and tech partners. It enables large-scale public participation in scientific research, covering fields from astronomy to ecology. Projects are often co-developed with universities, museums, and nonprofits.

SPOTTERON https://www.spotteron.net. An Austrian company that builds custom citizen science apps. It provides platforms for projects in environmental monitoring, biodiversity, and urban planning, allowing citizens to contribute geotagged data and observations.

iNaturalist (joint initiative, now supported by the California Academy of Sciences and National Geographic) **https://www.inaturalist.org** . Again, technically a nonprofit-led project, but it has significant partnerships with tech firms. The platform allows users to document biodiversity. It's used by researchers, governments, and private organizations for environmental tracking.

SciStarter (platform + partnerships) **https://scistarter.org.** SciStarter functions as a commercial–nonprofit hybrid. It collaborates with universities, libraries, and private sector actors to scale citizen science participation. It also provides infrastructure for integrating citizen science into formal education and policy.

Planet Labs https://www.planet.com. While its core business is satellite imagery and analytics, Planet has engaged in citizen science through partnerships and open-data initiatives. Its high-resolution Earth imagery supports environmental monitoring that complements grassroots efforts.

Wildlife Insights (Google + NGOs) **https://www.wildlifeinsights.org.** This platform uses AI and crowd-sourced identification to process camera trap images. Developed with Google and conservation organizations, it demonstrates how tech firms contribute to citizen-powered ecological research.

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Earthwatch Institute **https://earthwatch.org.** Although a nonprofit, Earthwatch runs expeditions and programs where paying volunteers (often from the private sector) contribute to scientific fieldwork. It's a model of "participatory science" with corporate sponsorship from companies like HSBC and Shell.

IBM (World Community Grid) **https://www.worldcommunitygrid.org.** This initiative invites volunteers to donate unused computing power for large-scale scientific research. Though not citizen science in the observation/data collection sense, it's still a form of public scientific collaboration.

Phase 1	Phase 2
• 2 Online Workshops 15 participants from 10+ European countries	• 2 Online Workshops 15 participants from 10+ European countries

Table 5 – Overview number of activities with Companies

The workshops will be run in contexts with an existing understanding of CS benefits for the private sector and a willingness to deepen the collaboration and participate in co-designing infrastructures and frameworks of cooperation and mutual support. The purpose of these workshops will be to understand what a proper research infrastructure might look like for the private actors (including technical requirements, as well as elements that would build trust).

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D2.1 Challenges assessment (optional)
- D4.3 Stakeholders' requirements report
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)
- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: VT.

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3.2.6. Education Systems

This stakeholder group includes different educational institutions such as elementary and secondary schools, higher education institutions (HEI), non-formal education institutions (museums, libraries) and educational bodies (Ministries of Education, etc.).

For the onboarding part, we plan to jointly identify potential participants and make a balanced selection based on the nature of the stakeholder group and the varying levels of technical expertise and formal experience with research infrastructures.

Some potential contacts are:

- representatives of ministries such as the Austrian Ministry for Women, Science and Research who is funding Sparkling Science 2.0 as well as other European authorities running relevant programmes
- teachers who are experienced in implementing citizen science projects in school, such as those participating in PlasticPirates Europe, Citizen Science Award, or projects funded under Sparkling Science and various other initiatives in Europe
- representatives of higher education institutions who are experienced in designing, implementing and analysing citizen science projects in an educational context such as members of the ECSA working group "Citizen science and universities", contact persons at research institutions, University of Zurich etc.
- educators in non-formal educational settings such as museums, for example the Natural History Museum Vienna, Science Museum of Trento, Museum für Naturkunde Berlin etc.
- for all sub-groups: members of relevant cross-cutting groups such as the ECSA working group "Learning and education in citizen science", ECS Academy "Network of educators and trainers", ECS Collaboration Group, national working groups on citizen science with schools
- at the European level, the schoolnet.

The diversity of stakeholders within this group requires an adapted strategy of engagement that differentiates between the needs of higher and lower educational institutions, formal and non-formal educational institutions, and policy-makers in education.The strategy will focus on extracting needs from the various educational institutions and translating them into requirements for policymakers to support the integration of CS into the school curricula.

In formal education, we expect to work with teachers, school principals and administrators who have experience implementing CS activities in their respective schools or are interested in doing so, both short and long term, and with a clear involvement of students as citizen scientists. This will build on various projects in Europe that have worked with schools, such as Sparkling Science projects or Plastic Pirates.

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In the case of Higher Education Institutions (HEI), we will target different areas of expertise. On the one hand, experts in didactics and education can provide insight into the state of research on how to work with education systems and the impact and needs of CS. On the other hand, experts on implementing CS activities in HEIs, e.g. through university teaching and capacity building, can provide an internal perspective. The inclusion of CS contact points and/or communication officers at HEI will also be considered.

Representatives from non-formal education institutions will be selected based on their experience working with different target groups outside formal education settings. Organisations such as museums, libraries and science centers can contribute extensive scientific as well as pedagogical and engagement expertise.

Finally, the aim is to involve education officers from ministries or other public authorities who have experience with citizen science and/or infrastructure and funding structures. This will ensure that a policy perspective is reflected in the engagement activities.

Additionally, engaging students (although they are part of the citizens group) in these conversations is essential for distilling the needs of the education systems they are part of. Specific national engagement workshops are foreseen as part of T4.2 and T5.2. in every partner country.

Needs & Opportunities:
Given the expected differences in stakeholder needs within this group, our approach in engaging these groups will have to be adaptive.

This group is expected to be able to name their needs, current challenges and expectations for change as concretely as possible. Those who implement CS activities and directly work with citizen scientists in an educator role, should be able to speak to the real-life technical processes and challenges, while researchers are expected to contribute to the research design, research data and publication aspects of CS activities. Public authorities can give a strategic framing and add the policy perspective to the discussion. We expect a high maturity level when it comes to both technical and non-technical aspects.

The initial overarching **needs** we have identified are:

- the integration of participatory science in these educational systems
- the production of resources, success stories, schemas for merging educational and scientific systems
- embedding CS in educational systems and teachers' training
- considering students' needs

Within these, distinctions will be made between the needs of different subgroups, as detailed below (non-exhaustive list):

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Schools

- Competency frameworks and information on how to implement them in teaching and learning.
- Age-appropriate scientific experiments, data collection activities, and educational modules.
- Training workshops, guides, and mentoring opportunities to help teachers implement and manage citizen science activities.
- Access to case studies and proven methodologies from projects like Sparkling Science, CSA or Plastic Pirates

HEI

- Platforms capable of supporting complex data collection, analysis, and suitable visualisation for research-level projects.
- Resources that allow citizen science to be incorporated into university courses, fostering hands-on learning and capacity building.
- Mechanisms to facilitate cross-disciplinary projects and research partnerships between different departments and external organisations.
- Opportunities for education experts to study the impacts of citizen science, improving methodologies and informing best practices.

Non-formal education institutions

- Workshops and toolkits for capacity-building to implement or increase citizen science in their activities
- Interactive, engaging citizen science platforms that cater to diverse audiences (varying in age, culture, and educational background).
- Material and information on accessible citizen science opportunities and on ways to adapt them according to their objectives/target groups

Educational bodies (Ministries of education and public authorities)

- Evidence-based guidelines, best practices and examples for integrating citizen science into national or regional education systems.
- Evaluations results of project outcomes to measure the educational impact of citizen science initiatives.
- Mechanisms that facilitate dialogue and partnership between government bodies, schools, universities, and non-formal education providers.
- Assurance that RIECS adheres to legal and ethical standards, particularly concerning the involvement of minors.

Students

- Lessons and educational materials to learn about citizen science and how to do research

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- Interactive and gamified interfaces that capture students' interest and encourage sustained engagement.
- Systems that help provide students with feedback on their contributions and acknowledge their role as citizen scientists.
- Ensuring the infrastructure is accessible to students from diverse backgrounds, including language options and culturally relevant content.

Opportunities

Co-design with educators: Engagement with this group will ensure that the infrastructure is not only scientifically sound, but pedagogically relevant. We will work with educational actors to ensure usability and scalability and encourage stakeholders to reflect on current alignment with national education priorities.

Curricular integration: RIECS can provide access to good practices, networks and data regarding the integration and potential streamlining of citizen science as a transversal component in educational curricula, following the successful example of how the Sustainable Development Goals (SDGs) were mainstreamed in many European education systems. With the contributions by educational experts, strategies will be identified to address citizen science not only as a subject of study, but as a way of doing science —— linked to inquiry-based learning, project work, and digital literacy.
Teacher training and professional development: RIECS can become a platform for training programmes and certification schemes to prepare educators to implement citizen science in formal and non-formal settings. Training concepts and modules could be promoted across countries and adapted by national communities or offered in collaboration with teacher networks.

Micro-credentials and skills recognition: To ensure the recognition of skills and learning achievements of educators, opportunities to integrate micro-credentials on diverse topics (e.g. digital data handling, ethics in participation, environmental monitoring) into RIECS will be examined. These can also feed into national qualification frameworks and lifelong learning strategies.

Towards a RIECS Academy: We can build on the existing ECS Academy to host and deliver training, certifications, and peer-learning activities in citizen science, supporting researchers, educators, and community actors alike.

Licensing for schools and educators: The infrastructure may offer dedicated access and licenses for schools, teachers and students— providing simplified tools, data platforms, ϖ educational content tailored to the needs of the classroom.

Pathways to research careers: By involving students and teachers as stakeholders in RIECS, its tools and services can serve as a gateway to scientific vocations, critical

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thinking, and active citizenship. This supports the broader European goals of STEM promotion and inclusive education.

Onboarding & Engagement:

Mapping out the initial needs will help plan the engagement with this diverse stakeholder group. At the same time, the onboarding and engagement strategy must acknowledge and address from the very beginning, not only the needs, but equally the potential **challenges** of engaging this stakeholder group, such as:

- (potentially in some contexts) low maturity in terms of CS
- a lack of time
- potentially low interest in participation if the outcomes are intangible or not relevant for the daily work (especially teachers need clear outcome and added value for their own work)
- low technical maturity level is expected, therefore a focus on the user experiences needs to be considered and might need slightly adapted objectives for project phase 1
- potential language barriers when it comes to technical discussions
- diverse needs of the different sub-groups need to be considered in the workshops
- diverse needs/contexts across project countries
- participants need a high level of expertise not only regarding their own institution but their national/regional contexts

The **key messages** used in onboarding this group will be:

- The opportunity to integrate CS into educational curricula to foster collaboration between educational institutions and the CS community.
- The opportunity to integrate innovative projects to the classrooms, and empower students to participate in real-world scientific research.
- The opportunity to participate in the co-design of future applications, toolkits and training materials for citizen science in education.
- The opportunity to contribute to best practices and useful resources tailored for education-policy makers, teachers and students.

The engagement will try to address **topics** like:

- needs for easy to use tools (such as applications) and services (such as trainings) to implement citizen science projects in educational settings
- how to ensure high levels of data protection and ethics
- data collection, management and analysis in CS projects in an educational setting
- interactions with other stakeholders on a technical and non-technical level
- monitoring and reporting of project outcomes

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- type of support needed to interact with RI
- user-centred elements of the RI (services, interface, etc.)
- integration and implementation of CS activities in the school curricula
- funding and policy support needed for the integration of CS activities
- research design, research data and publication of CS

The engagement will have different **formats**:

- Workshops
- Presentations or other events
- Networking sessions

Phase 1	Phase 2
• 2 Online Workshops 5 participants from schools 5 from higher education 5 from non- formal education, 5 from educational bodies geographical spread is crucial, the participants should be from different countries in the two workshops	• 2 Online Workshops 5 participants from schools 5 from higher education 5 from non-formal education, 5 from educational bodies geographical spread is crucial, the participants should be from different countries in the two workshops

Table 6 – Overview number of activities with Education Systems

The workshops may require preparatory material and a preparatory phase to build a common working knowledge on the topic within groups with different levels of engagement and expertise with CS. The workshop design will reflect the different perspectives of the sub-groups (e.g. educational practices, curricula, research methodology, public engagement, policy, etc.).

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D2.1 Challenges assessment (optional)
- D4.3 Stakeholders' requirements report
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)

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- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: OeAD.

3.2.7. Policy Makers

This stakeholder group includes policymakers who would potentially support and fund RIs at local, national and European levels, those who regulate in areas susceptible to being informed or influenced by CS in general, as well as international bodies and the UN agencies that are key to disseminating and promoting RIECS from the start. The engagement will focus on stressing the potential impact of RIECS to increase the group's commitment to supporting such an infrastructure. Furthermore, this group will be consulted on aspects they perceive as essential to such an infrastructure from a policy and data perspective.

In terms of onboarding policymakers, we foresee a selection of policymakers at all levels (local, national, European and global) and covering different sectors (e.g., open science, education, environment, innovation, society), as well as **UN and other international organisations**.

Examples of policy makers to be engaged will include high-level representatives from the UN Statistics Division (UNSD) and its Collaborative on Citizen Data, the Organisation for Economic Co-operation and Development (OECD), UN Human Settlements Programme (UN-HABITAT), National Statistical Offices, (NSOs) from different countries, such as Austria, Poland, Switzerland, Denmark, among others. Engagement will also extend to Local Governments for Sustainability (ICLEI), a global network working with more than 2500 local and regional governments committed to sustainable urban development, along with some of their local authority members.

At national level, we will activate the Ministries Advisory Board (MAB) as a key channel for engaging policymakers, with a strong focus on Member States. Policymakers— particularly at national and regional levels— are central to the future of RIECS. It is ultimately the Member States who will evaluate, endorse, and fund the infrastructure. Their early and meaningful involvement is therefore not optional, but essential to ensure long-term viability and alignment with national research and innovation strategies. A preliminary list has already been prepared, and initial invitations are underway.

Policymakers will serve as **multipliers**, and efforts to engage them will be directed primarily at securing their support for the RI.

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Needs & Opportunities:

As a particularly hard-to-reach and engage group of stakeholders, the approach to reaching out to policymakers will have to be flexible, adapt to their availability in order to boost their interest and commitment.

Thus far, we identified the following **needs** for this group:

- evidence-based policies (supporting sustainable development)
- better returns on investment in CS activities
- stronger society-science-policy partnerships, experimental spaces for collaboration and mutual exchange of experiences
- new methodologies to contribute to measuring progress towards SDG fulfillment
- supporting official statistics and addressing national data gaps and policy needs
- increase citizens' scientific and digital literacy and more citizen engagement in the society-science-policy nexus
- enhance trust in science for evidence-based policy
- promote knowledge-sharing among diverse nations and cultures

Boosting their motivation to engage in the co-design of the concept will be done by reiterating the needs and potential uses of RIECS for scientists.

Onboarding & Engagement:

At the same time, the onboarding and engagement strategy must acknowledge and address from the very beginning, not only the needs, but equally the potential **challenges** of engaging this stakeholder group, such as:

- a lack of time to engage in long-term co-design and participatory workshops
- a lack of knowledge of CS
- lack of harmonized methodologies in CS
- potential issues regarding representativeness, comparability and quality of CS data
- sustainability of CS data

The **key messages** used in onboarding this group will be:

- The opportunity to support the conceptualisation of an innovative RI that will allow large scale, granular and high quality data gathering to address key data gaps and foster evidence-based decision-making
- The benefits of their advocating for the recognition and support of CS in policy agendas
- The opportunity to explore funding and governance models to sustain a new RI that will help address pressing global challenges

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The engagement will address **topics** like:

- Key data gaps and whether and how CS can address them
- Integration of CS data into official monitoring and reporting activities
- Data harmonization between data from diverse sources (traditional and non-traditional), exploring how they can address each others' limitation and enhancing their combined strengths

The engagement will have different **formats**:

- Sessions organized in major events attended by key policy actors
- Casual one-on-one exchanges
- Workshops
- Semi-structured interviews

Phase 1	Phase 2
• 2 Online Workshops (one or both might also be held in-person at events CGSP team attends, if the opportunity arises) 3 RI funder representatives (EU level) 7 national-level policy makers 7 local-level policy makers	• 2 Online Workshops (one or both might also be held in-person at events CGSP team attends, if the opportunity arises) 3 RI funder representatives (EU level) 7 national-level policy makers 7 local-level policy makers

Table 7 – Overview number of activities with Policy Makers

UN/Other umbrella organisations

Phase 1	Phase 2
• At least one workshop • Networking events • Multi-SHs discussions • Brainstorming sessions	• At least one workshop • Networking events • Multi-SHs discussions • Brainstorming sessions

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For this engagement, we will leverage the CSGP connections both in Geneva and globally.	For this engagement, we will leverage the CSGP connections both in Geneva and globally.

Table 8 – Overview number of activities with UN/Other umbrella organisations

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D4.3 Stakeholders' requirements report
- D4.4 Global policy organisations report (UN/other umbrella)
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)
- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: CGSP.

3.2.8. Other EU RIs

The cooperation with other RIs is essential for bringing the CS community together and establishing an atmosphere of collaboration rather than competition, building synergies and exploiting potential complementarities among the RIECS and already established RIs. The ultimate goal of creating these synergies is to jointly provide support services to the wider community.

This group includes representatives from ESFRI, EOSC, and other relevant RIs, especially those focusing their work on climate change, health and earth observations.

Within these existing RIs we will focus on the research infrastructure managers, a group with which the consortium partner (UNIMIB) has much experience in both professional and educational contexts. This group is particularly interesting because they serve as contact points for the broader research community within different domains.

Needs & Opportunities:

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This stakeholder group's interest in citizen science is down to specific needs the group has. Thus far, we identified the **need** for:

- cross-collaboration across the CS community
- standardisation of practices across the CS community
- reinforcement of national initiatives, diverse citizen scientist and developer communities
- more interdisciplinarity within the RI landscape

With such a wide range of needs this stakeholder group is expected to be aware of the need for a RIECS. Boosting their motivation to engage in the co-design of the concept will be done by reiterating the needs and potential uses of RIECS for other RIs.

Onboarding & Engagement:

At the same time, the onboarding and engagement strategy must acknowledge and address from the very beginning, not only the needs, but equally the potential **challenges** of engaging this stakeholder group, such as:

- a competitive mindset and potentially the perception of RIECS as a threat to their existing activities
- limited time
- domain specific approach of infrastructures

The **key messages** used in onboarding this group will be:

- The opportunity to share their valuable knowledge and experiences in the technical implementation of RIs
- The opportunity to support the conceptualisation of an RI that will complement existing ones, as a bridge to society and support the advancement of scientific knowledge
- The possibility of discovering and exploring collaboration opportunities among diverse RIs
- The opportunity to inform and increase the use of CS and RIs in addressing global challenges and achieve sustainability goals
- The opportunity to shape how CS data and methodologies are integrated into international reporting and monitoring systems
- The opportunity to integrate CS into global research and policy frameworks towards a more excellent, inclusive and participatory approach.

The engagement will try to address **topics** like:

- Methodological approach to the use of Citizen Science Services by different RI

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The engagement will have different **formats**:

- Workshops aimed at solving specific issues relevant for other RIs

The event will be structured around the key stages of design thinking: empathize, define, ideate, prototype, and test, encouraging active contribution and iterative refinement. Participants will be encouraged to co-create actionable solutions and explore innovative ideas for cross-infrastructure collaboration.

Phase 1	Phase 2
• 2 Online Workshops representatives from all relevant European and International RIs, the ERIC- Forum, EOSC, Europeana, etc.	• 2 Online Workshops representatives from all relevant European and International RIs, the ERIC- Forum, EOSC, Europeana, etc.

Table 9 – Overview number of activities with other EU RIs

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

- D2.1 Challenges assessment
- D4.3 Stakeholders' requirements report
- D5.1 Outcome documentation of CS stakeholder summit

These reports (together with other reports dedicated to other stakeholder groups) will be the basis for completing:

- Challenges assessment (D2.1)
- Technical requirements (D2.2)
- Preliminary catalogue of services, resources and functionalities (D2.3)
- Organisational challenges (D3.1)
- Findings on RI non-technical requirements (D3.2)

which will all contribute to the final RIECS concept.

Stakeholder group steward: UNIMIB

3.2.9. Citizens

Citizens and practitioners are one of the project's main stakeholder groups and the ones whose contribution and voice will be present at all stages of the conceptualisation and

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co-design. The project puts a strong emphasis on citizens who have already participated in CS projects and are familiar with CS, including grassroots communities and independent practitioners, in an attempt to make their voices heard and advocate for their needs in policy briefs.

Aside from their contribution to the co-design activities, this group will be supported with training and capacity-building initiatives deployed in WPs 4 and 5, including workshops, webinars, and mentorship programs.

Ultimately, RIECS is intended to allow independent practitioners to create and manage their projects (even unipersonal ones) by offering access to tools for validation, project management, and data integration within larger databases, and ensure their work is more visible and easily integrated into broader scientific frameworks.

Needs & Opportunities:

This stakeholder group's interest in citizen science is down to specific needs the group has. Thus far, we identified the **need** for:

- open access to free-of-charge multilingual services and resources to perform CS
- open governance and transparency
- learning and skill development, recognition mechanisms
- data ownership, and data privacy and data protection compliant with EU regulations (GDPR).

Boosting their motivation to engage in the co-design of the concept will be done by reiterating the needs and potential uses of RIECS in their citizen science initiatives.

Onboarding & Engagement:

At the same time, the onboarding and engagement strategy must acknowledge and address from the very beginning, not only the needs, but equally the potential **challenges** of engaging this stakeholder group, such as:

- different maturity levels (especially when considering different contexts)
- needs and motivations for engaging with citizen science
- balancing data quality and scientific rigor with the design of meaningful and engaging citizen science activities
- diverse groups in terms of age, background, thematic interests and level of involvement
- in schools/with students: different approaches and low barriers to participation needed to motivate students to meaningfully contribute
- identifying and engaging intermediaries such as teachers, project leaders or platforms

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- reflecting diverse sub-groups such as different organisations, school types and disciplines

The engagement will try to address **topics** like:

- improving engagement practices in citizen science
- improving feedback mechanisms in citizen science
- use of data to inform and reform policies and address citizen and community concerns and needs
- (technical) barriers to participation in citizen science projects and potential solutions
- needs-based applications, services and interfaces for citizen scientists
- existing resources, networks, and trainings that the citizen scientists already know and use and those that would be helpful for future activities

The engagement will have different **formats**:

- Workshops
- In-person events using engaging formats such as World Café

Phase 1	Phase 2
• 32 Online Workshops / 4 workshops per country & partner min. 1 in-person workshop 3 online workshops 10+ participants (some previous, some new participants) 2 of the 4 workshops dedicated *exclusively to students* involved in CS projects 8 countries	• 16 Online/ In-Person Workshops / 2 workshops per country & partner 1 in-person workshop, 10+ participants 1 online workshop, 20+ participants 1 workshop dedicated *exclusively to students* involved in CS projects 8 countries

Table 10 – Overview number of activities with Citizens

The results of this engagement methodology will be assessed, and the engagement activities will be documented in the following **reports**:

Phase 1	Phase 2
• D2.1 Challenges assessment (optional) • D2.2 Technical requirements	• T3.2 Definition of non-technical requirements and refinement of technical requirements • D3.3 Data and metadata

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• D2.3 Preliminary catalogue of services, resources and functionalities • D3.1 Summary of Organisational challenges • D3.2 Findings on RI non-technical requirements • D4.2 Citizens requirements report • D5.1 Outcome documentation of CS stakeholder summit	criteria • D3.5 Report on technical feasibility and scientific excellence • D3.6 Final Impact assessment • D5.2 Citizens' requirements report II

which will all contribute to the final RIECS concept.

Stakeholder group steward: All consortium partners that are responsible for engagement activities with citizens.

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4. Stakeholder Groups

4.1. Engagement Strategy and Activities | Phase 1

The first engagement phase will run until M18 (June 2026) and will serve the first tasks and deliverables of the project. This phase will engage all stakeholder groups described in section 2.2 of this protocol in order to map the **technical requirements** of the RIECS, as well as other aspects such as governance, feasibility, data and metadata criteria or organisational challenges.

A visual timeline of the two engagement phases can be found in **Annex 3 - Timeline.**

The goal of this phase is twofold:

1. **define stakeholder needs**, including expanding on those the consortium has already identified and start mapping potential ways of addressing these needs through our concept.

   User Stories

   User stories will be used to gather the different perspectives of stakeholders within each group, and across all different groups. These stories will be the basis for identifying needs, and translating them into potential solutions, that can then be more accurately defined and evaluated. These will be the basis for an initial list of preliminary services, resources, or functionalities that a future RIECS should provide. Partners will set up a template together, in a way that information can be easily collected, analysed and interpreted for the different deliverables and tasks within the project.

   Each workshop host will use the same template to gather information in a consistent manner across all engagement activities.

   We start with a basic template (**Annex 1)** and plan to refine it as we move forward into the conceptualisation of the RIECS.

2. **refine the co-design and co-creation methodology**. The learnings from this phase will be used to design the engagement in the second phase.

   Workshop Documentation

   The workshop documentation will reflect on the co-design methodology and map strategies to improve it. This template (**Annex 2**) includes details about the

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participants (age, geographical representation, field/interests, CS maturity levels), as well as notes about the implementation of activities, strengths and weaknesses of the methodology used and learnings that can be used in future workshops.

This documentation will be made available to all partners for consultation.

Additionally, following the first round of workshops with citizens (which will be run locally in the eight countries of the different partners) and the first round of workshops with all other stakeholder groups in phase 1, partners will have one meeting to discuss the implementation of the workshop methodology and reflect on the different learnings.

These discussions will draw main conclusions which will be summarised in a separate document (**Engagement Activities_Round 1 Reflections**). This will allow partners to align their approach for the following rounds of workshops.

If needed, this process will be repeated after each round of workshops planned in Phase 1.

The deadline for running the engagement activities in Phase 1 is the 30th of April 2026. The following timeline is a guideline, and we expect there to be changes based on the availability of different stakeholders. The dates are indicative and not deadlines. The only hard deadline is the 30th of April 2026.

By this date, all consortium partners responsible for running the activities will have to have completed and uploaded to the Workshop Central Room the documents mentioned above, as follows:

- User stories (1 for every workshop but including perspectives from different stakeholders)
- Workshop documentation (1 for every workshop)

The documents will be gathered by responsible WP2 leaders (MAU, SZI, UNIMIB) and WP 4 leaders (ECSA, MAU, CSZ) who will be using them in the following deliverables sets of deliverables:

Deliverables based directly on the engagement activities in phase 1:

- D2.1 Challenges assessment (CSIC) due on 31 December 2025
  - T2.1 Identifying the technical challenges
- D4.2 Citizens requirements report (ECSA) due on 30 June 2026
  - T4.2 Mapping of citizens needs through citizen engagement (ECSA)
- D4.3 Stakeholders requirements report (MAU) due on 30 June 2026

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- T4.3 Mapping of requirements by stakeholder categories (MAU)
- D4.4 Global policy organisations report (UZH) due on 30 June 2026
  - T4.4 Integration with policy making organisations (CSZ)

Deliverables based on conclusions from the engagement activities (and summaries in the deliverables mentioned above) in phase 1:

- D2.4 Impact assessment framework (ZSI) due on 30 June 2026
  - T2.4 Impact assessment planning (ZSI)
- D2.2 Technical requirements (MAU)
  - T2.2 Definition of technical requirements (MAU) due on 30 June 2026
- D2.3 Preliminary catalogue of services, resources and functionalities (IBE) due on 30 June 2026
  - T2.3 Sketch of the catalogue of services, resources, and functionalities
- D3.1 Organisational challenges (UNIMIB) due on 31 Dec 2026
- D3.2 Findings on RI non-technical requirements (ECSA) due on 31 Jan 2027
  - Task 3.2 Definition of non-technical requirements and refinement of technical requirements

The deliverables will also inform the content of the engagement activities, which will be designed to gather relevant information for the deliverables. To that end, an activity might focus on more than one topic, e.g. both technical and organisational challenges. The topics will be decided during the methodology workshop.

4.1.1. Engagement Activities

Workshops

Citizens	**Other Stakeholder Groups**
32 workshops	18 workshops
Total: 50 workshops	

Table 11 – Overview number of workshops in phase 1

The workshops will be made up a three parts:

1. **Before the event.** One week before the workshop, consortium members will share with participants the research approach for each workshop (e.g. key aspects to cover) as well as the main insights already acquired during the RIECS-Concept project (e.g. already noted gaps, solutions and recommendations from previous workshops). This is intended to ease the incremental approach (avoid repeating the same conversation again and again) and would help participants situate themselves

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in the process. Participants will be asked to prepare their own key open questions, existing solutions and follow-up actions recommended.

2. **During the event**. Consortium members will briefly present the status quo (based on already identified needs and challenges in D2.1 Challenge assessment), and perform the collection of user stories cards, facilitating the conversation, the evaluation, and reporting when confirmation or disagreements may occur.

3. **After the event.** Consortium members will synthesise the results of the workshop or activity into a brief report on the user stories, as well as document the workshop and reflect on the methodology, sum up learnings and potential changes moving forward.

These activities could also be long-term (spanning over several weeks) and include making use of collaborative document editing platforms, or take the shape of virtual ideathons or CS labs or open online surveys.

4.1.2. Citizen Workshops

In the first phase, partners IBE/CSIC, OeAD, MAU, UNIMIB, CPN, VT, CSZ, ECSA will each run 4 workshops in 8 different countries.

Participants Requirements:

- 10+ participants from different fields of CS to ensure wide representation of perspectives
- At least two of the workshops per partner will be dedicated *exclusively to students* involved in CS projects
- A combination of previously involved participants and new participants is ideal after the second round

Format:

- 1 in-person workshop (at least)
- 3 online workshops

Goals:

The goals of the workshops in Phase 1 is to

- map the broad range of citizen needs
- identify commonalities between citizens involved in different CS projects
- create an inventory/catalogue of technological components–mainly services and resources

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- set the basis for a cohesive foundational design, responding to both technological and scientific challenges
- set the basis for a unified conceptual model for integrating data and metadata from diverse sources
- foster an open and participatory approach to governance
- fosters co-ownership, trust, and appeal towards wider uptake of CS, synergies and alliances between initiatives

Templates

- User Stories (**Annex 1**)
- Workshop Documentation (**Annex 2**)

Timeline

The outreach phase for the first phase is scheduled to start in June 2025. The final deadline for all engagement activities in phase one is the 30th of April 2026.

The following timeline is a guideline, and we expect there to be changes based on the availability of different stakeholders. The dates are indicative and not deadlines.

Within phase 1, for all citizen engagement activities we foresee 4 milestones, as follows:

1. **30th November 2025**: All partners have completed at least one workshop with citizens and have finalised the required documentation (user stories and workshop documentation).

   At the end of this stage, we foresee a first **methodology reflection meeting*** with all partners, in which the findings and learnings from the first round of workshops will be shared. This meeting is foreseen to take place at the end of **September** and will have two parts:

   a. one part focused on content: to discuss the main conclusions drawn from the user stories
   b. one part focused on methodology: to discuss the learnings from the first round of workshops and potential strategies for the second round of workshops.

   We aim to remain flexible in shaping the methodology and might include an extra methodology reflection meeting after the first few partners conducted their first citizen engagement activities.

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2. **31st January 2026**: All partners have completed the **second round of workshops** with citizens and have finalised the required documentation (user stories and workshop documentation). If needed, another reflection meeting can be held in November.

3. **31st March 2026**: All partners have completed the **third round of workshops** with citizens and have finalised the required documentation (user stories and workshop documentation). If needed, another reflection meeting can be held in February.

4. **30th April 2026**: All partners have completed the **fourth round of workshops** with citizens and have finalised the required documentation (user stories and workshop documentation).

At this stage, a second compulsory **methodology reflection meeting*** will be held to reflect on the entire first phase of the engagement strategy and define the methodology needed for the second stage. This meeting is foreseen to take place in early **May 2026** and will have three parts:

a. one part focused on content: to discuss the main conclusions drawn from the workshops in the first phase of engagement in preparation for the deliverables due at the end of this stage (June 2025)
b. one part focused on methodology: to discuss the learnings from the first engagement phase
c. Based on the reflection of the methodology used in the first phase and the conclusions regarding content, an initial plan for the methodology for the second phase of engagement will be discussed, as well as the first content directions.

* While these meetings will partially also focus on content and the conclusions drawn from the stakeholder engagement activities, they are only intended to kick start the work on the deliverables in WP 4. Subsequent meetings will be arranged by partners leading the different deliverables within WP 4 to analyse the learnings and summarise the conclusions of the engagement activities in more detail.

May and June 2026 will be dedicated to finalising the reports that include learnings and conclusions from this first round of citizen workshops:

- D4.2 Citizens requirements report
- D2.2 Technical requirements
- D2.3 Preliminary catalogue of services, resources and functionalities
- D2.4 Impact assessment framework
- D3.1 Organisational challenges

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4.1.3. Other Stakeholder Groups Workshops

In the first phase, partners MAU, IBE, ECSA, CSIC, VT, OaED, CSGP , UNIMIB will each run 2 workshops with the stakeholder groups they steward, as follows:

Researchers & Academics (MAU)	2 Online Workshops 15 participants from 10+ European countries at least 10 of them researching climate change, health, and environmental observations
CS Networks (IBE)	2 Online Workshops all relevant EU & beyond CS umbrella organisations, and ideally all national umbrella organisations
NGOs (ECSA)	2 Online Workshops 15 participants from 10+ European countries
Technology Providers (CSIC)	2 Online Workshops 15 participants from 10+ European countries
Companies (VT)	2 Online Workshops 15 participants from 10+ European countries
Education Systems (OaED)	2 Online Workshops 5 participants from schools 5 from higher education 5 from non- formal education, 5 from educational bodies geographical spread is crucial, the participants should be from different countries in the two workshops
Policymakers (CGSP)	2 Online Workshops 3 RI funder representatives (EU level) 7 national-level policy makers 7 local-level policy makers
Other RIs (UNIMIB)	2 Online Workshops representatives from all relevant European and International RIs, the ERIC- Forum, EOSC, Europeana, etc.

Table 12 – Overview number of workshops in phase 1 by stakeholder group

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Goals:

The goals of the workshops in Phase 1 is to

- map the broad range of stakeholder needs
- identify commonalities between stakeholders involved in different CS projects
- create an inventory/catalogue of technological components–mainly services and resources
- set the basis for a cohesive foundational design, responding to both technological and scientific challenges
- set the basis for a unified conceptual model for integrating data and metadata from diverse sources
- foster an open and participatory approach to governance
- fosters co-ownership, trust, and appeal towards wider uptake of CS, synergies and alliances between initiatives

Templates

- User Stories (**Annex 1**)
- Workshop Documentation (**Annex 2**)

Timeline

The outreach for the first phase is scheduled to start in June 2025. The final deadline for all engagement activities in phase one is the 30th of April 2026.

The following timeline is a guideline and we expect there to be changes based on the availability of different stakeholders. The dates are indicative and not deadlines.
Within phase 1, for all stakeholder engagement activities we foresee 2 milestones, as follows:

1. **30th November 2025**: All partners have completed the **first round of workshops** with their relevant SH groups and have finalised the required documentation (user stories and workshop documentation). At the end of this stage, we foresee a first **reflection meeting** with all partners, in which the findings and learnings from the first round of workshops will be shared. This meeting is foreseen to take place in **December 2025** and will have two parts:
    d. one part focused on content: to discuss the main conclusions drawn from the user stories
    e. one part focused on methodology: to discuss the learnings from the first round of workshops and potential strategies for the second round of workshops.
5. **31st February 2026**: All partners have completed the **second round of workshops** with their relevant stakeholders and have finalised the required documentation (user

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stories and workshop documentation). If needed, another reflection meeting can be held in February.

At this stage, a second **methodology reflection meeting** will be held to reflect on the entire first phase of the engagement strategy and define the methodology needed for the second stage. This meeting is foreseen to take place in **March 2026** and will have three parts:

a. one part focused on content: to discuss the main conclusions drawn from the workshops in the first phase of engagement in preparation for the deliverables due at the end of this stage (June 2025)
b. one part focused on methodology: to discuss the learnings from the first engagement phase
c. Based on the reflection of the methodology used in the first phase and the conclusions regarding content, an initial plan for the methodology for the second phase of engagement will be discussed, as well as the first content directions.

From February onwards, partners will start compiling the insights gathered within this phase and finalise the reports that include learnings and conclusions from this first round of citizen workshops:

- D4.3 Stakeholders requirements report
- D2.2 Technical requirements
- D2.3 Preliminary catalogue of services, resources and functionalities
- D2.4 Impact assessment framework
- D3.1 Organisational challenges

Engagement activities for UN/Umbrella Organisations

A set of different activities will also aim to engage UN and other umbrella organisations (ITU, WHO, UNICEF, WMO, UNDP, CERN among others), as well as NSOs (UNITAR) in RIECS.

Stewarded by CSZ, their involvement in RIECS will require a different approach compared to other stakeholder groups, based on a strategy of joining them where they already are and taking advantage of existing international gathering. The relationship between UN, other International Organizations, NSOs, and Citizen Science is as a critical synergy and these stakeholders often meet to advance sustainable development, data democratization, and evidence-based policymaking (e.g gatherings of the Global Partnership for Sustainable development Data or events such the session of the United Nations Environment Assembly). Discussions at existing gatherings will be complemented by dedicated brainstorms to be held at the SDG Solution Space in Geneva, conveniently located at the heart of the UN Headquarters.

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4.1.4. Potential co-design workshops with mixed SH groups

Co-design workshops including citizens as well as other stakeholder groups might be considered if a specific topic can benefit from the discussions between different stakeholder groups (e.g. in case there might be competing/divergent interests and needs, and a compromise needs to be reached).

These workshops are optional and will be planned if/when needed by the members of the consortium responsible for the tasks and deliverables these engagement activities might serve.

4.1.5. Citizen Science Stakeholder Summit

In September 2026 (M21), AE will organise the Stakeholders Summit as part of Ars Electronica Festival 2026. The event will be an occasion to reflect on the first phase of the engagement strategy and set the basis for the second phase.

The goal of the summit is to align stakeholders perspectives, and thus, it will bring together all stakeholder groups for a two-day workshop. The results of the workshop will be presented in a public programme on the third day and will be documented in D5.1 CS stakeholder summit.

The conclusions of the two-day workshop and the public presentations will further serve other tasks and deliverables, such as D5.2 Continuous citizen engagement and roadmap development, D5.3 Continuous stakeholder engagement and roadmap development, as well as Task 3.2 Definition of non-technical requirements and refinement of technical requirements, T3.4 Governance, sustainability, collaboration and policy support framework, T3.5 Technical integration feasibility study.

Moreover, the end of the summit will be used as an opportunity to reflect on the strategy outlined here, and adapt it, if necessary.

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4.2. Engagement Strategy and Activities | Phase 2

The second engagement phase will run until M36 (December 2027) and will serve the last tasks and deliverables of the project. This phase will engage all stakeholder groups described in section 2.2 of this protocol in order to map the **non-technical requirements** of the RIECS, as well as other aspects such as governance, feasibility, data and metadata criteria or organisational challenges.

The second phase of engagement will draw on most of the deliverables in WP 4 as well as on the learnings from the CS Stakeholder Summit. The goal of this phase is twofold:

1. **refine stakeholder needs**, expanding on those needs already identified in phase 1 using a user stories, but also other types of activities that are better suited for mapping organisational challenges, non-technical requirements, data and metadata criteria
2. **define non-technical aspects of the RI**, including developing a governance, sustainability, collaboration and policy support model, as well as to assess the impact and feasibility of the research infrastructure.

   User stories and workshop documentation will be used to map both technical and non-technical requirements. The template used in phase 1 will be refined to serve the needs of phase 2.

The deadline for running the engagement activities in Phase 1 is the 31st of October 2027. The following timeline is a guideline and we expect there to be changes based on the availability of different stakeholders. The dates are indicative and not deadlines. The only hard deadline is the 31st of October 2027.

By this date, all consortium partners responsible for running the activities will have to have completed and uploaded to our Workshop Room Control the documents mentioned above, as follows:

- User stories (1 for every workshop but including perspectives from different stakeholders)
- Workshop documentation (1 for every workshop)

The documents will be gathered by responsible WP3 tasks leaders (UNIMIB, ECSA, CSIC, IBE, ZSI) and WP 4 leaders (ECSA, MAU, CSZ) who will be using them in the following deliverables sets of deliverables:

Deliverables based directly on the engagement activities in phase 2:

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- D5.2 Citizens requirements report II (ECSA) due on 31 Dec 2027
  - T5.2 Mapping of citizens needs through citizen engagement (OaED)
- D5.3 Stakeholders requirements report II (MAU) due on 31 Dec 2027
  - T5.3 Mapping of requirements by stakeholder categories (MAU)
- D5.4 UN Agencies and IOs requirements report (UZH) due on 31 Dec 2027
  - T5.4 Ongoing engagement with UN Agencies and International Organizations (CSZ)

Deliverables based on conclusions from the engagement activities (and summaries in the deliverables mentioned above) in phase 2:

- D3.3 Data and metadata criteria (CSIC) due on 31 Dec 2027
  - T3.3 Outline of data and metadata compliance with EU framework
- D3.4 Governance, sustainability, collaboration and policy support framework (ECSA) due on 31 Dec 2027
  - T3.4 Governance, sustainability, collaboration and policy support framework
- D3.5 Report on technical feasibility and scientific excellence (IBE) due on 31 Dec 2027
  - T3.5 Technical integration feasibility study
- D3.6 Final Impact assessment (ZSI) due on 31 Dec 2027
  - T3.6 Impact assessment framework for the development, deployment, and management

The deliverables will also inform the content of the engagement activities, which will be designed to gather relevant information for the deliverables. To that end, an activity might focus on more than one topic, e.g. both technical and organisational challenges. The topics will be decided during the methodology workshop.

4.2.1. Engagement Activities

Workshops

Citizens	**Other Stakeholder Groups**
16 workshops	18 workshops
Total: 34 workshops	

Table 13 – Overview number of workshops in phase 2

The workshops will be made up a three parts:

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1. **Before the event.** One week before the workshop, consortium members will share with participants the research approach for each workshop (e.g. key aspects to cover) as well as the main insights already acquired during the RIECS-Concept project (already noted gaps, solutions and recommendations from previous workshops). This is intended to ease the incremental approach (avoid repeating the same conversation) and would help participants situate themselves in the process. Participants will be asked to prepare their own key open questions, existing solutions and follow-up actions recommended.
2. **During the event.** Consortium members will briefly present the status quo (based on already identified needs and challenges in D2.1 Challenge assessment), and perform the collection of user stories cards, facilitating the conversation, the evaluation, and reporting when confirmation or disagreements may occur.
3. **After the event.** Consortium members will synthesise the results of the workshop or activity into a brief report on the user stories, as well as document the workshop and reflect on the methodology, sum up learnings and potential changes moving forward.

These activities could also be long-term (spanning over several weeks) and include making use of collaborative document editing platforms, or take the shape of virtual ideathons or CS labs or open online surveys.

4.2.2. Citizen Workshops

In the second phase, partners IBE/CSIC, OeAD, MAU, UNIMIB, CPN, VT, CSZ, ECSA will each run 2 workshops in 8 different countries.

Participants Requirements:

- 10+ participants from different fields of CS to ensure wide representation of perspectives for the in-person workshop
- 20+ participants for the online workshop
- At least one of the workshops per partner will be dedicated *exclusively to students* involved in CS projects

Format:

- 1 in-person workshop
- 1 online workshop

Goals:

The goals of the engagement activities in Phase 2 are:

- expand the range of citizen needs & requirements
- map organisational challenges

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- map data and metadata criteria
- assess the impact of RIECS on CS projects and society at large
- develop a governance, sustainability, collaboration and policy support framework
- foster an open and participatory approach to governance
- fosters co-ownership, trust, and appeal towards wider uptake of CS, synergies and alliances between initiatives

Templates

- User Stories (**Annex 1**)
- Workshop Documentation (**Annex 2**)

We will continue the standardised documentation of the discussions and of the workshops activities in the second phase as well. Templates and other documentation materials will be reworked closer to the second phase, so that we can apply the learnings and findings from phase 1 to their design.

Timeline

The outreach phase for the second phase is scheduled to start in July 2026. The final deadline for all engagement activities in phase one is the 31st of July 2027.

The following timeline is a guideline and we expect there to be changes based on the availability of different stakeholders. The dates are indicative and not deadlines.

Within phase 2, for all citizen engagement activities we foresee 2 milestones, as follows:

1. **31st December 2026**: All partners have completed at least one workshop with citizens and have finalised the required documentation (user stories and workshop documentation).

   At the end of this stage, we foresee a **methodology reflection meeting*** with all partners, in which the findings and learnings from the second round of workshops will be shared. This meeting is foreseen to take place in **January 2027** and will have two parts:

   a. one part focused on content: to discuss the main conclusions drawn from the user stories
   b. one part focused on methodology: to discuss the learnings from the first round of workshops and potential strategies for the second round of workshops.

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2. **31st July 2027**: All partners have completed the **second round of workshops** with citizens and have finalised the required documentation (user stories and workshop documentation).

*While these meetings will partially also focus on content and the conclusions drawn from the stakeholder engagement activities, they are only intended to kick start the work on the deliverables in WP 4. Subsequent meetings will be arranged by partners leading the different deliverables within WP 4 to analyse the learnings and summarise the conclusions of the engagement activities in more detail.

August-December 2027 will be dedicated to finalising the reports that include learnings and conclusions from this second phase of citizen workshops:

- D5.2 Citizens requirements report II
- D3.3 Data and metadata criteria
- D3.4 Governance, sustainability, collaboration and policy support framework
- D3.5 Report on technical feasibility and scientific excellence
- D3.6 Final Impact assessment

4.2.3. Other Stakeholder Groups Workshops

In the second phase, partners MAU, IBE, ECSA, CSIC, VT, OaED, IIASA, UNIMIB will each run 2 workshops with the stakeholder groups they steward, as follows:

Researchers & Academics (MAU)	2 Online Workshops 15 participants from 10+ European countries at least 10 of them researching climate change, health, and environmental observations
CS Networks (IBE)	2 Online Workshops all relevant EU & beyond CS umbrella organisations, and ideally all national umbrella organisations
NGOs (ECSA)	2 Online Workshops 15 participants from 10+ European countries
Technology Providers (CSIC)	2 Online Workshops 15 participants from 10+ European countries
Companies (VT)	2 Online Workshops

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	15 participants from 10+ European countries
Education Systems (OaED)	2 Online Workshops 5 participants from schools 5 from higher education 5 from non- formal education, 5 from educational bodies geographical spread is crucial, the participants should be from different countries in the two workshops
Policymakers (CSGP)	2 Online Workshops 3 RI funder representatives (EU level) 7 national-level policy makers 7 local-level policy makers
Other RIs (UNIMIB)	2 Online Workshops representatives from all relevant European and International RIs, the ERIC- Forum, EOSC, Europeana, etc.

Table 14 – Overview number of workshops in phase 2 by stakeholder group

Goals:
The goals of the engagement activities in Phase 2 are:

- expand the range of citizen needs & requirements
- map organisational challenges
- map data and metadata criteria
- assess the impact of RIECS on CS projects and society at large
- develop a governance, sustainability, collaboration and policy support framework
- foster an open and participatory approach to governance
- fosters co-ownership, trust, and appeal towards wider uptake of CS, synergies and alliances between initiatives

Templates

- User Stories **(Annex 1**)
- Workshop Documentation (**Annex 2**)

We will continue the standardised documentation of the discussions and of the workshops activities in the second phase as well. Templates and other documentation materials will be reworked closer to the second phase, so that we can apply the learnings and findings from phase 1 to their design.

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Timeline

The outreach phase for the first phase is scheduled to start in July 2026. The final deadline for all engagement activities in phase one is the 31st of July 2027.
The following timeline is a guideline and we expect there to be changes based on the availability of different stakeholders. The dates are indicative and not deadlines.

Within phase 2, for all citizen engagement activities we foresee 2 milestones, as follows:

31st December 2026: All partners have completed at least one workshop with their respective stakeholders and have finalised the required documentation (user stories and workshop documentation).

At the end of this stage, we foresee a first **methodology reflection meeting*** with all partners, in which the findings and learnings from the first round of workshops will be shared. This meeting is foreseen to take place in **January** and will have two parts:

a. one part focused on content: to discuss the main conclusions drawn from the user stories
b. one part focused on methodology: to discuss the learnings from the first round of workshops and potential strategies for the second round of workshops.

3. **31th July 2027**: All partners have completed the **second round of workshops** with their respective stakeholders and have finalised the required documentation (user stories and workshop documentation).

*While this meeting will partially also focus on content and the conclusions drawn from the stakeholder engagement activities, they are only intended to kick start the work on the deliverables in WP 5. Subsequent meetings will be arranged by partners involved in the different deliverables within WP 5 to analyse the learnings and summarise the conclusions of the engagement activities.

August-December 2027 will be dedicated to finalising the reports that include learnings and conclusions from this second phase of citizen workshops:

- D5.2 Citizens requirements report II
- D3.3 Data and metadata criteria
- D3.4 Governance, sustainability, collaboration and policy support framework
- D3.5 Report on technical feasibility and scientific excellence
- D3.6 Final Impact assessment

Engagement activities for UN/Umbrella Organisations

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A set of different activities will also aim to engage UN and other umbrella organisations (ITU, WHO, UNICEF, WMO, UNDP, CERN among others), as well as NSOs (UNITAR) in RIECS.

Stewarded by CSZ, their involvement in RIECS will require a different approach compared to other stakeholder groups, based on a strategy of joining them where they already are and taking advantage of existing international gathering. The relationship between UN, other International Organizations, NSOs, and Citizen Science is as a critical synergy and these stakeholders often meet to advance sustainable development, data democratization, and evidence-based policymaking (e.g gatherings of the Global Partnership for Sustainable development Data or events such the session of the United Nations Environment Assembly). Discussions at existing gatherings will be complemented by dedicated brainstorms to be held at the SDG Solution Space in Geneva, conveniently located at the heart of the UN Headquarters.

4.2.4. Potential co-design workshops with mixed SH groups

Co-design workshops including citizens as well as other stakeholder groups might be considered if a specific topic can benefit from the discussions between different stakeholder groups (e.g. in case there might be competing/divergent interests and needs, and a compromise needs to be reached).
These workshops are optional and will be planned if/when needed by the members of the consortium responsible for the tasks and deliverables these engagement activities might serve.

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5. Conclusions

The engagement methodology presented in this report establishes a comprehensive, inclusive, and adaptive approach to co-designing the future RIECS infrastructure. It is grounded in continuous collaboration, mutual learning, and responsiveness to the diverse needs of ten stakeholder groups. By combining structured coordination among partners with iterative engagement activities, the methodology ensures that stakeholder voices are not only heard but translated into actionable insights for the development of RIECS.

The dual-phase engagement process enables both early mobilisation and long-term involvement, supporting a wide-ranging and representative dialogue. From citizen scientists to policymakers and technology providers, the strategy supports genuine co-creation and ownership of the future infrastructure. This participatory foundation is essential to ensure the relevance, acceptance, and sustainability of RIECS within the European research landscape.

The methodology will continue evolving through reflection, documentation, and adaptation, serving as both a roadmap and a resource for the project and for other initiatives exploring inclusive research infrastructure design.

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6. Annexes

6.1. Annex 1 - User Story Template

This template is to be used by all partners during stakeholder engagement activities. It supports structured and consistent collection of user stories for analysis and co-design of RIECS services, resources, and functionalities.

User Story ID	RC-[SH Group/Code]-[Number] (e.g. RC-SH01-001)
Workshop / Engagement Session	Title and date of the session
Submitted by	Name and organisation
Stakeholder Group	- RESEARCHERS & SCIENTISTS: SH01 - CS NETWORKS: SH02 - NGOs: SH03 - TECHNOLOGY PROVIDERS: SH04 - COMPANIES: SH05 - EDUCATION SYSTEMS: SH06 - POLICY MAKERS: SH07 - OTHER EU RIs (UNIMIB): SH08
User Type	e.g. "As a biodiversity researcher..."
Task / Need	e.g. "I want to access validated citizen-generated air quality data..."
Goal / Expected Outcome	e.g. "...so I can integrate it into my local policy analysis."

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Main Topic Label	Choose one: Metadata, Interoperability, Training, Ethics, etc.
Sub-labels	Select multiple: FAIR, Privacy, Mobile, Language, Quality, etc.
Overlaps with Existing Story?	Yes / No / Unsure (if yes, reference ID)
Additional Notes	Free text: context, urgency, relevance, barriers, etc.

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6.2. Annex 2- Workshop Documentation Template

Workshop Title:
[Name + location or online]

Date:
[DD/MM/YYYY]

Partner(s) Responsible:
[Name(s), Organisation(s)]

Facilitators:
[List of people involved in organising/running the session]

PARTICIPANT PROFILE

Category	Notes
Total number of participants	
Age range	☐ 18–25, ☐ 26–40, ☐ 41–60, ☐ 60+
Geographic distribution	e.g. country, region
Field of work / interest	e.g. health, environment, education
Level of CS experience	☐ Novice ☐ Occasional participant ☐ Experienced ☐ Organiser

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Stakeholder groups	☐ Citizens ☐ Scientists ☐ Policy ☐ NGOs ☐ Education ☐ Others

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METHODS USED

- Brief description of co-design method(s):
  [e.g. World Café, User Story Cards, Mapping, Online brainstorming]

- Activities conducted:
  [Short list with objectives of each activity]

- Strengths of the methodology in this workshop:
  [e.g. good participant engagement, clear outputs]

- Weaknesses or limitations observed:
  [e.g. time constraints, difficulty engaging some participants]

- Suggestions for improvement:
  [Short reflection or feedback from facilitators/participants]

OUTPUTS COLLECTED

☐ User Stories
☐ Needs Mapping
☐ Prioritised Service Ideas
☐ Other: [Specify]

Summary of Key Learnings:
[Highlight any important findings for project-wide analysis]

Attachments:

☐ Photos (if consent given)
☐ Slides/Visual materials
☐ Participant quotes
☐ Completed user story templates
☐ Other files: [Link or filename]

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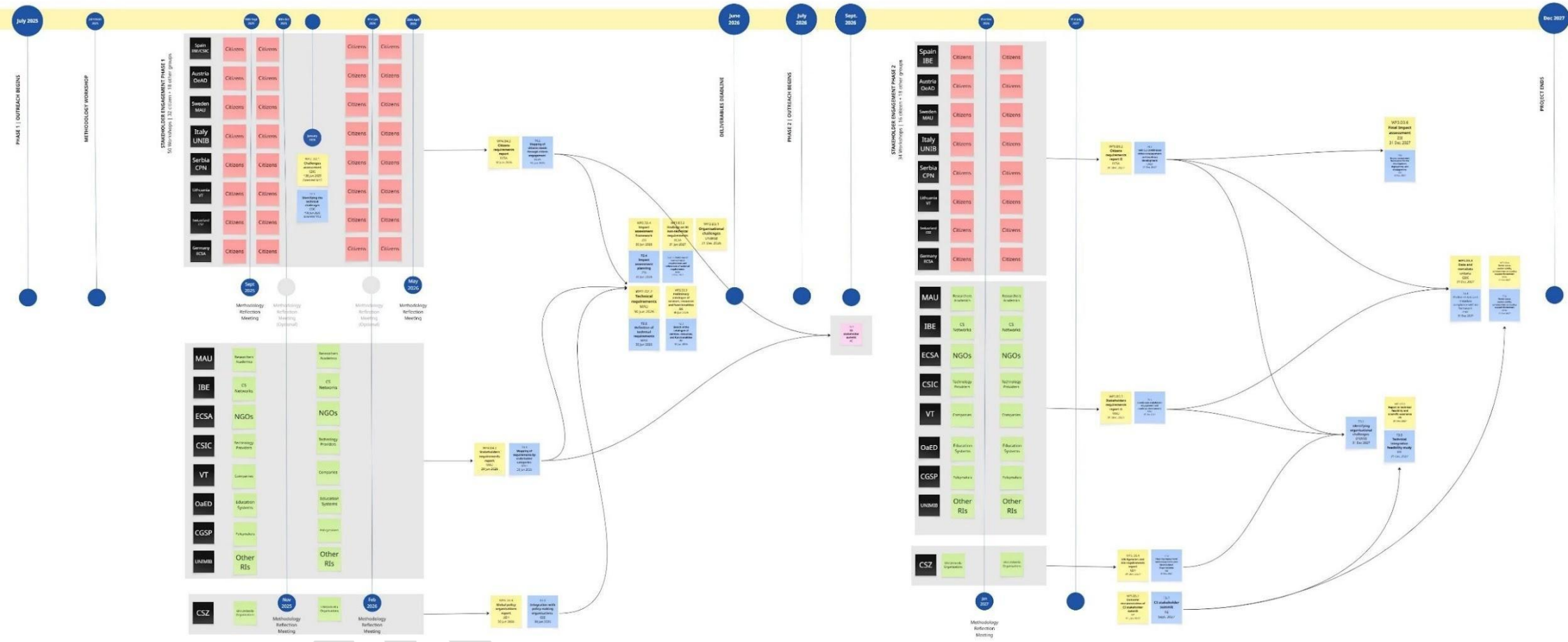
6.3. Annex 3 - Timeline



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