ANERIS

Operational Sensing Life Technologies for Marine Ecosystems

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Deliverable D6.3 – Exploitation and Sustainability

Lead Beneficiary: EGI

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Executive Summary

An exploitation and sustainability plan is essential for Horizon Europe projects to maximize impact, facilitate knowledge transfer, create economic and social value, ensure continuity, and engage stakeholders effectively. It provides a roadmap for the successful exploitation and long-term sustainability of the project's results, ultimately contributing to the advancement of science, technology, and societal well-being.

The Deliverable 6.3. provides key concepts, definitions, processes and expected exploitation measures and activities to perform during the project along with the engagement strategies and business or sustainability plans. It recaps the necessary baseline information from ANERIS expected technologies and key exploitable results and provides the plan, templates and key performance indicators to ensure the project results will deliver highest scientific, economic and societal impact.

List of Abbreviations

DMP – Data Management Plan

DoA – Description of Action

EOSC – European Open Science Cloud

FAIR – Findability, Accessibility, Interoperability, Reproducibility

IP – Intellectual Property

IPR – Intellectual Property Rights

KER – Key Exploitable Result

OMB – Operational Marine Biology

TRL – Technology Readiness Level

1. Introduction

ANERIS project has the overall objective of developing the next generation of scientific instrumentation tools and methods for sensing marine-life. Different types of marine life-sensing technologies will be integrated into the developed instruments and methods:

- Genomics,
- Imaging-biooptics
- Participatory sciences

The technologies will be implemented using a co-design methodology, involving all relevant stakeholders: academia, industry, civil society and government. The project works on the concept of Operational Marine Biology (OMB), meant as a biodiversity information system for systematic and long-term routine measurements of the ocean and coastal life, ready to be accessed and analyzed for rapid interpretation and dissemination.

Operational Marine Biology data will be collected following FAIR principles and will be carried out in a distributed IT infrastructure built from edge and cloud compute nodes, to be connected with the European Open Science Cloud (EOSC).

11 technologies will be tested and validated in four case studies, involving the ANERIS innovations, commercial instruments to be improved and different world-class research infrastructures (RI). The project will develop a training program for the operation and use of these new solutions for all the involved stakeholders and particularly the research infrastructures staff.

1.1. Scope and purpose of the document

The purpose of D6.3 document is defining the key concepts, processes and expected measures and activities to perform during the project along with the engagement strategies and business or sustainability plans. When necessary, templates are introduced. It is not the aim of this deliverable to present the progress towards the realization of exploitation activities (this will be presented in subsequent deliverables – but the baseline for assessing the progress toward the Technologies created and improved during the project its related IPR, the Key Exploitable Results and Key Performance Indicators as provided they in the DoA are provided.

This is expected to be a live document to be updated along the project, as such, any necessary adjustment to the plans, any new processes or update to templates will be incorporated in the subsequent deliverables to be submitted in the middle of the project (M24) and by the end of the project (M46).

Mid-term deliverable will focus on updating mainly the results information and the general exploitation progress, the final iteration of the deliverable will highlight main outcomes coming

from the exploitation activities and how they have been contributing to the sustainability of the project results and the future impact generation.

1.2. Structure of the document

The document is structured following way,

- First chapter provides the general introduction.
- Second chapter describes an overview of the methodologies that will be used during the project to assess the progress towards exploitation and sustainability, including relevant definitions.
- Third chapter provides the baseline status of ANERIS technologies, Key Exploitable Results.
- Forth chapter describes conclusions and next steps.
- Templates are provided in the annexes.

1.3. Framework Context

The activities related to the Exploitation and Sustainability Management in the ANERIS project fall under task 6.3. Main activities covered by the task:

- Capture project results and KERs,
- Define best IP protection approach and specific exploitation plans,
- Promote the testing and early adoption of ANERIS technologies with SMEs and industries.

The Innovation Manager (Task 6.3 leader) will liaise with partners concerning publications and patents, and will be in charge of desk research along generated documents, deliverables and project material, discerning results generated during the project, identifying their potential use and a proposed protection policy.

From an operational point of view innovation manager role (T6.3) is expected:

- To generate Exploitation and Sustainability plan defining the operational innovation management processes (D6.3)
- Identify and articulate the Key Exploitable Results (KERs) – including for each of them the specific project results and related ownership, IP.
- Analyze market evolution, to collect necessary feedback to improve the project results.
- Organize necessary sessions during project events (e.g., brainstorming sessions, hands-on workshops on exploitation planning, business modeling or sustainability)

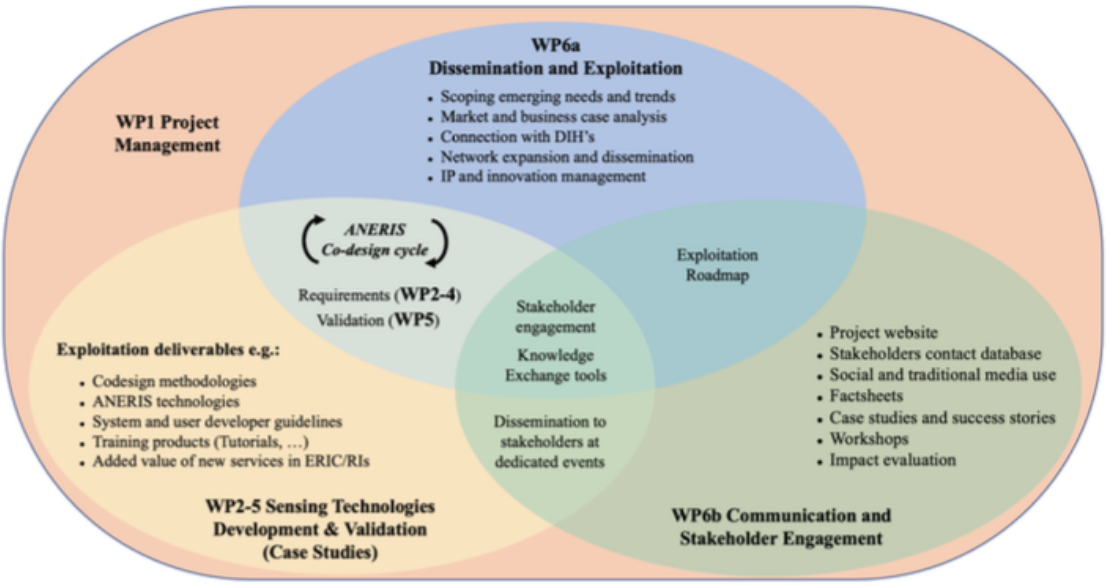

Figure 1: *WP6 Context and relation with other WPs*

The main work package outputs are:

- D6.3. Exploitation and Sustainability Plan (M6) and its subsequent updates at M24, M48.

This deliverable complements the other deliverables in WP6 referring to the dissemination and engagement tasks – including the definition of stakeholders and engagement and communication strategy of the targeted audiences.

- D6.1. Plan for Communication and Dissemination of Results – and its iteration at M24.

This activity will also contribute to the IPR, exploitation and impact information of the project progress reports (continuous reporting).

In order to build and collect the different results a thorough review of all the other deliverables will be done including D1.3 the Data Management Plans to understand the Data outputs of the project, and the deliverables from the technical work packages (WP2, WP3, WP4, WP5) will provide the necessary information to understand the building blocks, technologies and use cases performed during the project.

It is noteworthy to highlight the work related to the ANERIS project is bound to the following legal documents:

- Grant Agreement Nr. 101094924 between the European Commission and the Coordinator
- Consortium Agreement between all project partners

Those specific articles and clauses regulate Exploitation, Results, Ownership and joint ownership, Access, and Open Science among others. Some of those have been included in the definitions section.

2. Methodology

Exploitation and Sustainability Management approach of the ANERIS project is developed from the Innovation Management know-how developed within the EGI foundation along many projects (EOSC-Hub, C-Scale, Imagine, InterTwin) and adapts some of the guidelines provided by ISO 56002:2019 Innovation management — Innovation management system[1] into a Horizon Europe Project.

Main activities foreseen for ANERIS are

- Identification of Key Exploitable Results
- IPR Management
- Exploitation Management
- Market Analysis
- Sustainability and business modeling
- Impact assessment

2.1. Identification of Key Exploitable Results

A **Key Exploitable Result (KER)** is an identified main interesting result (as defined above) which has been selected and prioritised due to its high potential to be "exploited" – meaning to make use and derive benefits- downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education.

Initial selection of KERs is provided in the impact section of the DoA. During the project duration KERs information will be complemented to provide for each of them, information on Ownership, main target groups and stakeholders, Value Proposition, and the Main developments done during the C-SCALE project and the future work. This information is in line with the required information for including the KERs into Horizon Platform:

KER Ownership: The KER Owner pertains to the entities or institutions holding legal or intellectual property rights over the outcome. Identifying the ownership information is crucial, as it may involve an individual researcher, a research institution, a company, or a jointly owned result within the consortium. This information establishes authority and responsibility for the KER, ensuring its exploitation and long-term sustainability.

Target Groups: The Target Groups are specific audiences or stakeholders for whom the KER is designed. They comprise both the target user group or beneficiaries, such as researchers, industry professionals, policymakers, or the general public, and the interest groups defined in the Horizon Platform.

[1] https://www.iso.org/standard/68221.html

Value Proposition: The Value Proposition elucidates the unique benefits that the KER offers to its users, customers, or target groups. It highlights the advantages and primary benefits that distinguish the KER from existing assets**.**

Current & Future Development: This aspect provides an overview of completed developments during the project and outlines any planned future enhancements, updates, or iterations of the KER.

TRL Level: TRL stands for Technology Readiness Level and is a measure of the maturity of a technology or innovation. According to European Commision following are the different levels:

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

The TRL Level indicates the stage of development the KER has reached, ranging from early concept stages to fully validated and commercially deployable. Specifying the TRL Level is crucial for the later onboarding of the results to the EOSC marketplace , among others.

For further defining KERs, the project will use the Horizon Results Platform (HRP) template (provided in Annex 1) as much as possible to collect information related to the KERs to ensure the alignment with the portal.

2.2. IPR Management

This activity aims to document the intellectual property assets brought into the project by project partners (background), and the new one that will be l be generated during the project duration, takint into account that the ANERIS IPR strategy will be also aligned with the EC and national policies concerning IP ownership and exploitation, considering confidentiality and other aspects.

IP Management Plan:

- As such, all consortium partners will contribute with background IP and know-how, without any additional cost, and they will remain its owners. The Consortium Agreement based on the latest template of DESCA 2020 provides the necessary guidelines.
- As part of the work conducted in ANERIS, various types of Intellectual Property will be generated, which includes documents, datasets, software tools, wearable tools, methods, models, databases and know-how.
- Results will be owned (or jointly owned) by the partner (or partners) generating the result.

- Open science principles presented in the DoA – all intellectual property assets must prevail **as open as possible, as closed as necessary.** Unless otherwise stated all written material will be shared & accessible under CC BY creative commons licenses.

IPR Management main activities during the project:

- Identification of Background, Third party and Sideground ensuring that access conditions are well described and met for implementation and future exploitation (template provided – part of Annex 1)
- Identification of Results, including its ownership information, intellectual property right and access conditions or license. (Template provided part of annex 3)

Each partner / owner of results is responsible to protect their assets according their internal regulations. Innovation manager can provide facilitation in case any agreements are needed or to help partners to decide best options if they are undecided.

2.3. Exploitation

According to the Grant agreement, beneficiaries must *take measures aiming to ensure 'exploitation' of its results (either directly or indirectly, in particular through transfer or licensing; by:*

- *(a) using them in further research activities (outside the action);*
- *(b) developing, creating or marketing a product or process;*
- *(c) creating and providing a service, or*
- *(d) using them in standardisation activities.*

Further Research Activities (beyond the project): Beneficiaries should aim to leverage the project results as a basis for future research endeavors. This can involve the following activities**:**

- Publishing research papers or academic articles that build upon the project outcomes.
- Presenting findings at conferences, workshops, or seminars to disseminate knowledge and engage with the scientific community.
- Collaborating with other research institutions or experts to expand on the project's findings.
- Incorporating the results into new research proposals or projects, utilizing the knowledge and insights gained during the current project.

Product Development: Beneficiaries should explore avenues to transform the project results into tangible products, processes, or innovations. Some examples of activities include:

- Developing prototypes or proof of concepts based on the project's findings, which can be refined for eventual commercialization.
- Obtaining intellectual property rights (IPR) for inventions or innovations arising from the project and pursuing patent applications.

- Collaborating with industry partners to translate the research outcomes into marketable products or processes.
- Conducting market research and feasibility studies to assess the commercial viability of the project results.
- Establishing spin-off companies or startups to bring the developed products or processes to market.

Service Creation: Beneficiaries should consider how the project results can be transformed into valuable services for end-users or customers. Some examples of activities include:

- Offering consulting or advisory services based on the expertise and knowledge gained from the project.
- Developing software tools or platforms that provide specialized services or solutions to address specific user needs.
- Providing training programs or workshops to transfer knowledge and skills related to the project results.
- Collaborating with relevant stakeholders to establish service-oriented partnerships or consortia.
- Conducting user surveys or engagement activities to understand the needs and requirements of potential service users.

Contributing to Standardization Activities: Beneficiaries should actively contribute to standardization efforts by utilizing the project results to influence or shape industry or domain-specific standards. Some examples of activities include:

- Participating in standardization committees or working groups relevant to the project's domain.
- Sharing project outcomes and research findings with standardization bodies for consideration in the development of new standards.
- Collaborating with industry partners to establish best practices and guidelines based on the project's results.
- Contributing to the development of technical specifications or protocols that improve interoperability or ensure compatibility within a specific field.
- Providing input and feedback on draft standards or participating in public consultations related to relevant standardization activities.

2.4. Market Analysis

A basic market analysis is important because it helps researchers and project stakeholders gain a comprehensive understanding of the landscape in which the project results will be deployed and utilized. It provides valuable insights into the demand, competition, potential customers, and opportunities for commercialization or adoption of project outcomes. By conducting a market analysis, project teams can make informed decisions, refine their strategies, and maximize the impact and sustainability of their results.

The main points to be covered in a market analysis for a Horizon Europe project include:

Market size and growth potential: Assessing the current size of the target market and its projected growth helps understand the market's potential and opportunities for project results. This includes examining the number of potential users, customers, or beneficiaries and estimating the market's potential reach.

Market trends and dynamics: Identifying and analysing market trends, such as emerging technologies, changing regulations, or evolving user needs, provides insights into the dynamics shaping the market. Understanding these trends helps project teams align their results with market demands and stay ahead of the competition.

Target audience and customer segmentation: Defining the target audience and segmenting customers based on their characteristics, needs, and preferences helps tailor project results to specific user groups. This enables better customization and ensures effective communication and adoption strategies.

Competitive analysis: Evaluating the competitive landscape helps identify existing or potential competitors offering similar solutions or addressing similar market needs. Analysing competitors' strengths, weaknesses, market positioning, and strategies assists in developing differentiation strategies and identifying unique selling points.

2.5. Sustainability and business modelling

Sustainability in the context of ANERIS results refers to the continuation and utilization of the project outcomes beyond its completion or in different project contexts. To ensure sustainability, several critical aspects must be addressed

Ownership: Ownership refers to the identification of the entity or entities that have legal or intellectual property rights over the KERs. It is important to establish clear ownership to define the rights, responsibilities, and control over the result. This ensures proper protection, management, and decision-making regarding the its use, dissemination, and further development

Access: Access refers to the availability and accessibility of the KER to relevant stakeholders, such as researchers, service providers, or user communities. Ensuring access involves establishing mechanisms or policies that enable authorised individuals or organisations to utilise the results effectively. This can include defining access rights, licensing terms, and technical infrastructure to facilitate the sharing and dissemination of the result.

Maintenance and Support: Maintenance and support involve activities aimed at preserving the functionality, reliability, and usability of the KER over time. This includes regular updates, bug fixes, improvements, and user support services. It is important to establish mechanisms to address any potential issues or challenges that may arise during the use and deployment of the KER. Adequate maintenance and support ensure the continued availability and usefulness of the result.

Costs: Costs refer to the financial considerations associated with the development, deployment, and long-term sustainability of the KER. This encompasses the investment required for its creation, maintenance, and support activities, including personnel, infrastructure and any other costs. Effective cost management involves assessing expenses and establishing sustainable funding models to cover those, whether through grants, subscriptions, licences, or other revenue streams, or if those costs will be covered by owning partners in order to ensure the long-term viability of the result.

Expected Returns: Expected returns relate to the benefits or value that stakeholders anticipate deriving from the KER. These returns can include scientific, economic, societal, or environmental impacts. Assessing the expected returns helps justify the investment in the KER and provides a basis for decision-making regarding its sustainability. It is important to evaluate and communicate the potential returns to attract stakeholders, foster collaborations, and secure ongoing support and resources.

Task 6.3 will regularly organize discussions with project partners around business modelling in several exploitation co-creation workshops for the necessary KERs generated in the project. This workshop will contribute to fill in the above-mentioned aspects. Further tools may be used such as Business Model Canvas[2] and Lean Canvas[3], SWOT analysis. The resulting analysis will be presented in the different iterations of this deliverable (M24, M48). The evolving objectives of the workshops may vary during the execution of the project and also include the identification and further refinement of the KERs, definition of suitable IPR management strategies for those, assessment of exploitation paths.

2.6. Impact Assessment

In order to assess the impact generated during the project and the we use the framework described by Horizon Europe recommendations. In this three complementary perspectives: scientific, societal and economic are presented:

Scientific impact: *Promote scientific excellence, support the creation and diffusion of high-quality new fundamental and applied knowledge, skills, training and mobility of researchers, attract talent at all levels, and contribute to full engagement of the Union's talent pool in actions supported under the Programme.*

Societal impact: *Generate knowledge, strengthen the impact of R&I in developing, supporting and implementing Union policies, and support the uptake of innovative solutions in industry, notably in SMEs, and society to address global challenges, inter alia the Sustainable Development Goals (SDGs).*

Economic impact: *Foster all forms of innovation, facilitate technological development, demonstration and knowledge transfer, and strengthen deployment of innovative solutions*

[2] https://www.strategyzer.com/canvas/business-model-canvas

[3] https://leanstack.com/lean-canvas

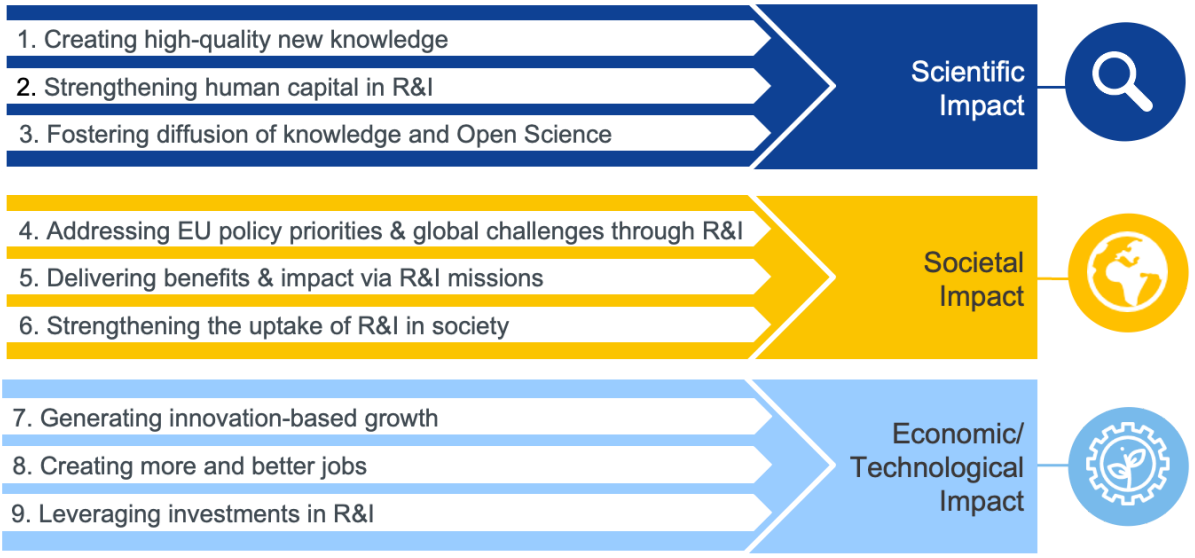

Figure 3. Three impact drivers.[4]

Finally, in order to summarize all the points – the impact canvas presented in the DoA will be updated. The Impact Canvas provides a structured framework for Horizon Europe projects to show the intended pathways impacts. By addressing specific needs, setting clear expected results, planning dissemination and exploitation measures, identifying target groups, and defining both outcomes and impacts, projects can effectively communicate their objectives, track progress, and maximize the value and sustainability of their outcomes.

Specific Needs: This section identifies and defines the specific needs or challenges that the project aims to address. It provides a clear understanding of the context and the problem that the project seeks to solve.

Expected Results: Expected Results describe the tangible outputs and deliverables that the project expects to achieve. These can be specific products, technologies, methodologies, or knowledge that will be developed or generated during the project.

Dissemination, Exploitation, and Communication Measures: This section outlines the strategies and activities planned for disseminating and exploiting the project's results. It includes communication plans, dissemination events, intellectual property management, and any other measures to ensure the wider use and impact of the project outcomes.

Target Groups: Target Groups refer to the specific stakeholders or beneficiaries who will directly benefit from the project's results. These can include researchers, policymakers, industry sectors, civil society organizations, or the general public. Identifying the target groups helps tailor the project's activities and communication efforts accordingly.

[4] https://ec.europa.eu/research/participants/docs/h2020-funding-guide/other/event210609.htm

Outcomes: Outcomes are the direct and measurable changes or effects that are expected to result from the project's activities. These can include changes in knowledge, practices, behaviors, policies, or any other relevant outcomes that occur during or shortly after the project.

Impacts: Impacts represent the broader and long-term changes or effects that the project aims to contribute to. These impacts can be societal, economic, environmental, or policy-related, and they create positive benefits in line with the project's objectives and the needs of the target groups.

3. ANERIS Exploitation & Sustainability Baseline

As described in the DoA, the exploitable results from WPs 2-5 include a wide range of marine-life related technologies: acquisition systems, services, protocols, guidelines, software, algorithms, demonstration platforms and case studies. Documentation on these exploitable results will be made available through the project website and through online repositories. Further documentation in the shape of video tutorials, (recorded) seminars, and animations, particularly for RIs technical staff, will be added where needed as part of the training activities along WP2-4.

3.1. Key Exploitable Results Baseline

- **KER 1: ANERIS Technologies.** Operational Marine Biology tools
- **KER 2: ANERIS Training.** Guidelines, user manuals, best practices, and training materials (videos, workshops).
- **KER3: ANERIS Co-Design.** Iterative process of transdisciplinary learning
- **KER4: ANERIS Cyberinfrastructure.** VRE for OMB Technical description and guidelines
- **KER 5 ANERIS – Community.** Community of researchers, RI operators, start-ups, innovative ecosystems and maritime related DIHs, citizen scientists

3.2. IPR Management Baseline

Technologies

- **NANOMICS** NAnopore sequeNcing for Operational Marine genomICS; EMBRC- HCMR, VLIZ, BIOPOLIS
- **MARGENODAT** workflows for the MARine GENOmics DAta managemenT.; VLIZ, EMBRC, LifeWatch
- **SLIM-2.0** A Virtual Environment for genomic data analysis (ANERIS extended version); NORCE, BIOPOLIS
- **EMUAS** Expandable Multi-imaging Underwater Acquisition System; OsloMet, UPC, MI, UH, Quanta
- **AIES-ZOO** (Automatic Information Extraction System for ZOOplankton images); SU.
- **AIES-PHY** (Automatic Information Extraction System for PHYtoplankton images); VLIZ
- **ATIRES** (Automatic underwaTer Image REstoration System); UH
- **AIES-MAC** (Automatic Information Extraction System for MACroorganisms); CNRS, BIOPOLIS

- **AMAMER** (Advanced Multiplatform App for Marine lifE Reporting); Dribba CSIC, Quanta
- **AWIMAR** Adaptive Web Interfaces for MARine life reporting, sharing and consulting; MarsBased , Quanta, CSIC
- **AMOVALIH** Advanced Marine Observations VALidation-Identification system based on Hybrid intelligence. CSIC Quanta

Case Studies

- **CS1: High-temporal resolution marine life monitoring in RI observatories.** Deployment of Imaging flow cytometers and in situ imagers in two EMSO nodes (SmartBay and OBSEA) and one LifeWatch/EMBRC node (VLIZ observatory)
- **CS2. Improved spatial and temporal resolution of marine life monitoring based on genomics:** Complement and extend an existing network of genomic based monitoring using the technology advances and low-cost procedures developed in WP2
- **CS3. Large scale marine participatory actions (bioblitzes).** Extend the experience of local bioblitz (BioMARato 2021) to cover all the European Seas, including different habitats (shallow waters, intertidal and coastal areas).
- **CS4. Merging imaging and genomic information in different monitoring scenarios.** By combining imaging and genomic, the main goal of this CS is to develop accurate quantitative data of high taxonomic resolution by developing proper algorithms based on image information, metabarcoding information and AI-approaches

Infrastructure

- **ANERIS Sensing technologies**
  - Genomics
  - Participatory
  - Impaging / Blooptics
- **OMB Data Production**
- **Use-case applications**

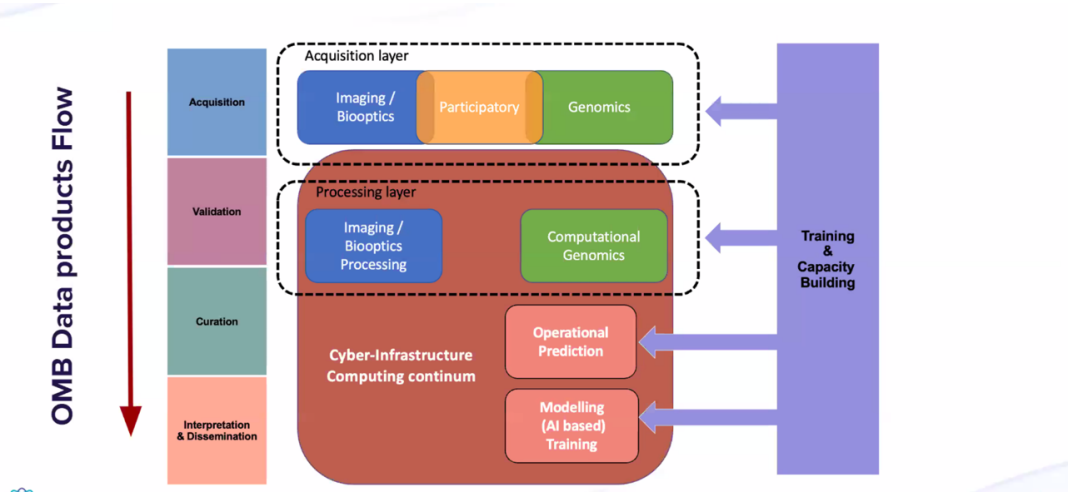

Figure 4: Overall IT Infrastructure, dataflows and planned trainings

3.3. Exploitation Baseline

KER Exploitation Paths

Table 1: *KER Exploitation Paths*

KER Nr	KER name	Exploitation Path
KER 1	ANERIS Technologies	Integration into the EOSC portal. Offer as a service. Individual exploitation plan
KER 2	ANERIS Training	Available for download, open repositories (Zenodo)
KER 3	ANERIS Co-Design	Science4change via online Physical workshops
KER 4	ANERIS Cyberinfrastructure	EOSC, EGI
KER 5	ANERIS – Community	Scientific tourism companies

Individual Exploitation Plans

Table 2: *Individual Exploitation Plans*

Partner	Technology	Exploitation Plan Baseline
HCMR	**NANOMICS**	Optimised protocols based on Nanopore sequencing technologies for high-throughput assessment and monitoring of different components of marine biodiversity, which can be routinely applied in marine observatories
VLIZ	**MARGENODAT**	Optimised workflows for marine genomics data aggregation and reformatting data to be seamlessly connected to the bioinformatics pipelines and therefore applicable as first level data management tool by marine stations and labs.)
NORCE	**SLIM-2.0**	Extended version open-source web application that simplifies the creation and the scaled execution of environmental genomics data processing pipelines
OsloMet	**EMUAS**	Proposed new technology that will allow the concatenation, in an expandable way, of several cameras to develop cost-effective multi-imaging arrays. It can be exploited in many context were multi-camera underwater vision is required: (i) as a stand-alone system, (ii) as an extension of existing cabled underwater observatories

SU	**AIES-PHY**	Automatic Information Extraction System for Phytoplankton images that will be validated with particular instruments in ANERIS. Potential exploitation with other commercial instruments
Dribba	**AMAMER**	Multiplatform app to facilitate the reporting of marine life. The results could be exploited in other contexts, including commercial applications
MarsBased	**AWIMAR**	The adaptive web interfaces could be exploited in other contexts, including commercial applications.
CSIC	**AMOVALIH**	The hybrid intelligence method for validating marine observations could be exploited in other contexts, including commercial applications.
EMSO-UPC	**Obsea**	EMSO-ERIC fixed underwater station for ocean monitoring will expand their capacity in terms of numbers of measuring variables integrating new sensing technologies that would be exportable to other cable observatories. The incorporation of the Imaging Flow Cytometer (Cytosub) at the end of the project, as part of the operational instrumentation in the node will enhance significantly the observational capabilities for plankton monitoring
BIOPOLIS	**AIES-MAC, NANOMICS, SLIM 2.0, AMAMER**	We will apply and validate technologies developed in ANERIS (AIES-MAC, NANOMICS, SLIM 2.0, AMAMER) to survey biodiversity in Atlantic coastal sites. The results could be exploited in other contexts, including commercial applications. A potential company for this commercialization is ElectricBlue, a start-up hosted by BIOPOLIS.
SfC	**Co-Design Methodology**	Will continue exploiting the Codesign methodology within and beyond ANERIS for the co-development of technology-based services, as well as its inclusive engagement model and the citizen science initiatives
CYBO	**Imaging Flow Cytometer (CytoSub**	The opportunity to deploy two instruments in underwater cabled observatories will provide the optimal framework to test and validate improvements in the instrument (among them: global performance, acquisition speed, data transmission, power consumption) that will make it more competitive in the market.

3.4. Market Potential Baseline

The market potential of the optimal use of marine life resources can be demonstrated through the following examples and economic figures. The implementation of a citizen observatory project showcases two economic activities with significant potential:

- Assisting in cost-effective measures to control marine invasive species: According to a 2010 study and the European Environment Agency (EEA), the annual cost of the impact of

invasive alien species (IASs) on the European economy was estimated to be around €12 billion. The current observation system for invasive species is considered slow, highlighting the need for early eradication. The service provided by the citizen observatory project addresses this issue, potentially saving significant costs associated with the impact of IASs.

- Public participation in citizen science: Citizen science activities, such as bird and wildlife watching, have shown to generate substantial economic benefits. A survey by the US Fish & Wildlife Service, cited by UK Defra, estimated that bird and wildlife watchers contribute approximately $85 billion annually to the economy and create 900,000 jobs. The citizen observatory project aims to engage the public in marine life monitoring, potentially leading to economic benefits through activities such as tourism and retail.

Based on these economic variables, the ANERIS project identifies the following target groups:

- **Industries, research infrastructures (RIs), and small and medium-sized enterprises (SMEs) linked to sensing technologies**: The technological solutions developed by ANERIS have the potential for broader application beyond marine sensing life. This includes other instrumental and research infrastructure frameworks, such as health-related monitoring systems, expanding the market potential for ANERIS solutions.
- **Organizations, particularly SMEs, involved in early warning activities**: Companies and organizations interested in services related to continuous monitoring, evaluation of exploitation sites, early warning of changes in marine life, and effects of hazardous substance spills can benefit from ANERIS. Integration with commercial activities in tourism and education is also possible, with proper mechanisms for collaboration and control.
- **Administration and government authorities:** ANERIS's monitoring services can enhance official data collection and help administrations fulfill their legal requirements for monitoring marine life and the environment. The demand for tools like ANERIS is expected to be significant, especially if they improve forecasting capabilities and reduce monitoring costs.
- **Citizens concerned about marine life sustainability:** ANERIS offers educational services, including mobile apps and web-related tools, which can engage citizens and provide them with valuable information about marine life. The project's ability to handle citizen feedback and recognize contributions through mobile-based social networking applications enhances its appeal and promotes citizen involvement.

3.5. Sustainability and business modelling baseline

As described in the DoA, in order to maximize the impact and the legacy of the project outputs, ANERIS will dedicate the last 12 months to impact acceleration and actions to support the stakeholders' uptake activities of the technical solutions. Moreover, the connection of ANERIS with EOSC through the **EOSC-marketplace** will become the instrument **for achieving long-term sustainability** as it will act as a **one-stop-shop for the developed solutions**.

3.6. Impact baseline

At M6 the impact canvas stays the same as the baseline canvas presented in the DoA

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
N1. Enhanced **global competitiveness and technological excellence of Europe** in an extremely fast-moving environment through investments into the development of forward-looking technical instruments and tools for European RIs. OBJ1,2,3 **N2.** Enhanced competitiveness of European industry through **co-development with industrial actors** of advanced RI technologies and technology transfer. OBJ1,3,5 N3. Opening up of new areas of research and development of new industrial applications/products. OBJ1 N4. Development of skills of RI staff aligned with the advancements of the RI technologies. OBJ4,5 N5. Transdisciplinarity, cross - fertilisation and a wider sharing of knowledge and technologies between academia and industry OBJ3 **N6. Wider use of AI in research** and enhanced data-based research across Europe. OBJ5	**KER 1 ANERIS - TECHNOLOGIES** 11 new generation of life-sensing technologies linked to 4 ERICs and 2 RIs, including a Citizen Observatory (MINKA). **N1-6** **KER 2 ANERIS - TRAINING** Guidelines, user manuals, best practices and training materials (videos, workshops). 11+ Training materials offered as open resource in EOSC training marketplace. **N4** **KER 3 ANERIS - CODESIGN** Co-design methodology to establish a quintuple innovation helix framework that will connect all the actors (academia, industry, government, and civil society) in the process of defining and implementing the different ANERIS technological solutions. **N1,2,5** **KER 4 ANERIS - CYBERINFRASTRUCTURE** co-developed and deployed ANERIS technologies in different RIs to scale up the FAIR data management and dissemination pipelines of OMB data products. **N1,6** **KER 5 ANERIS - NETWORK** Networks to connect all the actors (academia, industry, government, and civil society) to promote improved methods of marine life monitoring in the framework of Blue Economy and	The Plan for Communication and Dissemination of Results (PECD, D6.1) and the Exploitation and Sustainability Plan (ESP, D6.3) submitted at M6 **Dissemination***:* 1) Online dissemination (the results will be disseminated through ANERIS communication channels); 2) Scientific dissemination (through scientific publications in journals and presentations, etc.); 3) nonelectronic dissemination (through poster and flyer); 4) Physical interactive dissemination (via events). *It will target TG1, TG2 and TG3 stakeholders in different ways* **Exploitation** of the KERs: • **KER1**: All ANERIS technology developers. NANOMICS (HCMR); MARGENODAT (VLIZ); SLIM-2.0 (NORCE); EMUAS (OsloMet); AIES-ZOO (SU); AIES-PHY (VLIZ); ATIRES (UH); AIES-MAC (CNRS); AMAMER (Dribba); AWIMAR (MarsBased); AMOVALIH (CSIC); commercial instrument developers (CYBO, CNRS) and Underwater Observatories (MI, UPC) • **KER2** (EMBRC, EuroBioImaging, Pensoft, CSIC) • **KER3** SfC • **KER4** Quanta Labs, EGI • **KER5** MedCities, FECDAS, CSIC

	linked to the different RIs involved in the project. **N3,5**	**Communication**: ANERIS will develop the following communication tools that will allow to raise awareness about the ANERIS project among the target stakeholders and will implement related communication activities (details in D6.1): website, social media, e-newsletters, press releases/project communications, flyers, posters, videos, scientific publications, podcasts, factsheets, infographics, events, etc.

TARGET GROUPS	OUTCOMES	IMPACTS
Target Group 1: *stakeholders involved in the project and case studies activities* • RI staff (to be trained) • Industry (SMEs in touristic business) • Citizen scientists: Civil society engaged in participatory activities (citizen observatories) • Local authorities • General public **Target Group 2:** *stakeholders targeted for the project's exploitation and dissemination activities* • Authoritative systems (GBIF, EurOBIS, EMODNET-Biology, etc.) • Policy makers and other public Authorities • Academics interested on ANERIS technologies	At least 5 scientific publications by the end of the project related to the different proposed technologies reaching an audience of at least 500 people by end of the project, with over 2,000 in the following 2 years Technology uptake and adoption by at least 3 RI's, and 5 relevant stakeholders from networking activities, with over 10 stakeholders in the following 5 years Adoption of OMB data products (linked to RI's) as reference data in at least one EU framework directive within 5 years. Promoting interactions with Digital-Innovation-HUBs. At least 5 partnerships with thematic DIH will be established during the project and 10+ in five years. Promotion of the EU Blue Growth Strategy. The Catalan Federation of Underwater Activities (FECDAS, as ANERIS partner) that will promote the ANERIS networking and scientific tourism activities at regional scale. It is expected to involve more than 100+ SMEs within 5 years	Scientific / Technological: • Involve more than 100+ SMEs linked to Blue Economy within 5 years • Improved competitiveness of the marine, ocean and environmental companies through the use of the AI driven tools developed in the project • Improved competitiveness of the marine instrumental companies, and the IT-related that will participate in the project Societal / Environmental: • Better protection of the marine environment and life conservation • Increase and long-term engagement of citizens in observatories and citizen science initiatives • Adoption of OMB data products (linked to RI's) as

• SMEs and Industries through Digital Innovation Hubs • Other citizen science initiatives • Other municipalities and cities **Target Group 3:** *general public that could potentially be interested in the project and will be reached with dissemination activities*	At least 10 training events specific for RI staff and no less than 15 complementary ones for the general public. ANERIS training materials (at least 1 for each of the 11 technologies proposed in the project) will be offered as open resource in EOSC training marketplace. Quintuple helix innovation model. At least 12 co-design and 15 dissemination events will be carried out to connect no less than 20+ SMEs, local authorities and civil organisations. At least 5 of the technological solutions developed in ANERIS will include specific components based on AI solutions. A minimum of 15 datasets will be analysed using AI-based tools	reference data in at least one EU framework directive

3.7. Key Performance Indicators

Exploitation Indicators	Target	Means of verification
Number of co-design workshops	10	Attendance list
Number of business plans established for the Key Exploitable Results	4+	WP6 Reporting
Number of municipalities contacted	30+	WP6 Reporting
Number of partnerships with Digital Innovation Hubs	5+	WP6 Reporting
Number of companies involved in exploitation activities	20+	WP6 Reporting
Number of citizen scientists using ANERIS technologies	1000+	WP4 Reporting
Number of services integrated into the EOSC	5+	WP5 Reporting
Number of validated observations accessible through open data repositories	15000+	WP2-4 Reporting

4. Conclusions and Next Steps

This document D6.3 has presented most relevant key concepts, processes and expected exploitation measures and activities to perform during the project along with the engagement

strategies and business or sustainability plans. Templates have been introduced and the baseline for assessing the progress toward the ANERIS Key Exploitable Results, technologies, etc.

Next iteration will be presented M24 and will update the plans and provide a first overview of the progress towards the baseline data provided in this first iteration. Final version of the document will be presented at the end of the project (M46).

Annex

Annex 1: Template for Background

According to the Grant Agreement (Article 16.1) Background is defined as “data, know-how or information (…) that is (…) needed to implement the Action or exploit the results”. Because of this need, Access Rights have to be granted in principle, but Parties must identify and agree amongst themselves on the Background for the Project. This is the purpose of this attachment.

NAME OF THE PARTY

As to NAME OF THE PARTY, it is agreed between the Parties that, to the best of their knowledge, the following Background is hereby identified and agreed upon for the Project. Specific limitations and/or conditions, shall be as mentioned hereunder:

Describe Background	Specific restrictions and/or conditions for implementation (Article 16.4 Grant Agreement and its Annex 5, Section “Access rights to results and background”, sub-section “Access rights to background and results for implementing the Action”)	Specific restrictions and/or conditions for Exploitation (Article 16.4 Grant Agreement and its Annex 5, Section “Access rights to results and background”, sub-section “Access rights for exploiting the results”)

Annex 2: Template for Project Results

Description

Name	<Name of the Project Result>
Description	<Describe the result in brief>
URL	<URL(s) to the result>
WPs and Tasks involved	<List all the Work Packages including Tasks involved in generating the result>
Result Type	<Select one of the following> • Policy Related Results • Scientific or Technological R&D results (including HW) • ICT Software Digital Solution • Other Intangible Results • Services • Other
Result Contact Person	<Contact information of the primary contact person for the result>

Impact and Innovation

Innovation	<Describe what is new in the result. How it benefits the users and society in general>
Potential beneficiaries or customer groups	<Describe the potential user groups for the result. For each group describe, • what is the exploitation/use objective for them? (eg use for further research, use for policy support, etc)? • What are the main messages you want to deliver? • What are the best channels to deliver messages? • How will the target group (when they hear your message and want to use the result(s)) access and use the results, and under what terms (i.e. who do they approach, where is the result located, etc)?>
Geographical Market	<Describe the local or global geographical regions for which the result has been developed primarily>

IPR Information

<table>
<tr><td colspan="2">Are there IPR issues that will limit foreseen use?</td><td></td></tr>
<tr><td>IP Background</td><td colspan="2"><Please list all IP components related to the result brought by the partners into the project. This might be reports, software code, etc. There may be several IP components for each result. Don’t forget know-how – which may be delivered as training or consultancy to support use.>

<table><tr><th>Name</th><th>Short Description</th><th>IP Owner</th><th>Type of protection or licensing action used</th><th>Protection or licensing actions used</th></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Third-party IPs</td><td colspan="2"><Please list all IP third-party components which IP is owned by organizations outside the project.>

<table><tr><th>Name</th><th>Short description</th><th>IP Owner</th><th>Type of protection or licensing action used</th><th>Protection or licensing actions used</th></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>IP Sideground</td><td colspan="2"><Please list all IP components which are relevant to the project but produced outside the project by any of the partners during the project’s tenure (providing a summary of the components of this aggregate result)>

<table><tr><th>Name</th><th>Short description</th><th>IP Owner</th><th>Type of protection or licensing action used</th><th>Protection or licensing actions used</th></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
</table>

IP Foreground	<Please list all IP created during the project. Include all the IPs related to components of this result.>

Name	Short description	Partners Owner & Other Beneficiary(s) involved during the project	Related contribution of Partners involved during the project	Who will manage the IP (Host/Protect/ Market/Exploit) and under what terms?	Confidential Click on YES/NO	Foreseen embargo date	Type of protection or licensing action used	Protection or licensing actions used	How costs and revenues will be decided and shared?
					Yes No		Patents Trademarks Registered designs Utility models Others		

Dissemination

Early Adopters	<Briefly describe who are the early adopters>
Dissemination Channels	

Annex 3: Template for Key Exploitable Results

Results

<table>
<tr><td>Title of result (120 characters)</td><td>Ideally, a punchy name that makes sense to someone who hasn’t heard about ANERIS.</td></tr>
<tr><td>Message/ Teaser to the potential user (1000 characters)</td><td>State what your result is, what it is for, what makes it special in terms of adding value or knowledge, what is your purpose for making it public, and what is your target audience.

Refer to: page "Five_Ws" in Wikipedia</td></tr>
<tr><td>Video/ image section</td><td>Upload an image (primary goal: visually attractive item to draw attention and trigger curiosity) or add a link to a YouTube/Vimeo video.</td></tr>
<tr><td>Result Type</td><td>Select one from the following list,

<table>
<tr><td>• Policy Related Results</td><td>• Scientific or Technological R&D results (including HW)</td><td>• ICT Software Digital Solution</td></tr>
<tr><td>• Other Intangible Results</td><td>• Services</td><td>• Other</td></tr>
</table>
</td></tr>
<tr><td>Target Audience</td><td>Select max three from the list,

<table>
<tr><td>• Others/ No specific audience</td><td>• Public or private funding institutions</td><td>• EU and Member State Policy-makers</td></tr>
<tr><td>• International Organisations (ex. OECD, FAO, UN, etc.)</td><td>• Other Actors who can help us fulfil our market potential</td><td>• Research and Technology Organisations</td></tr>
<tr><td>• Academia/ Universities</td><td>• Private Investors</td><td></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>Our needs are</td><td>Select max three from the list,
<table>
<tr><td>• Business partners - SMEs, Entrepreneurs, Large Corporations</td><td>• Incubators / Accelerators</td><td>• Marketing Mentoring or Coaching</td></tr>
<tr><td>• Financing Expertise</td><td>• Technology Transfer Expertise</td><td>• Legal / IPR advise</td></tr>
<tr><td>• I/we wish to transfer my/our IPR to an interested party</td><td>• Investor readiness training</td><td>• Investor introductions</td></tr>
<tr><td>• Business plan development</td><td>• Expanding to more markets /finding new customers</td><td>• Executive Training</td></tr>
<tr><td>• Business Angels</td><td>• Venture Capital</td><td>• Crowd-fundin g Equity</td></tr>
<tr><td>• Other type of Investment</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>We specifically need/ are looking for (600 words)</td><td>Freeform description of what the result owners are looking for (more specifically than the selection from the list) from the members of the target audiences selected.</td></tr>
</table>

About us

Main project	EC-funded project that was the main contributor
Other related projects	Optional – won't be visible in the entry
Result Contributors	The partners that contributed to the result.
Owners for exploitation	Partners that will serve as contact points for further exploitation.

Start-up created for further exploitation?	• Yes • No
Logo	Not applicable unless there's a startup in the works

Testimonials

Title	Title of the success story collection (should at least contain material that is not created by the contributors or owners). You can add several entries on this section (click Add information)
Link	URL

Find us on

Description	This could be e.g. homepage or EOSC marketplace entry. As with testimonials, it is possible to add more than one line: homepage + marketplace entry ideal solution.
Link	URL

Results description and influence

Result description (1200 characters)	A more detailed description of the result, freeform.
Business Sector(s)/ Policy Area(s)	Select max three from the list,

Agriculture and rural development	Banking and financial services	Borders and security	Budget	Business and industry	Climate action
Competition	Consumers	Culture and media	Customs	Digital economy and society	Economy, finance and the euro
Education and training; Employment and social affairs	Energy; Environment	EU enlargement	European neighbourhood policy	Food safety	Foreign affairs and security policy

	<table><tr><td>Fraud prevention</td><td>Home affairs</td><td>Humanitarian aid and civil protection</td><td>Institutional affairs</td><td>International cooperation and development</td><td>Justice and fundamental rights</td></tr><tr><td>Maritime affairs and fisheries</td><td>Migration and asylum</td><td>Public health</td><td>Regional policy</td><td>Research and innovation</td><td>Single market</td></tr><tr><td>Sport</td><td>Statistics</td><td>Taxation</td><td>Trade</td><td>Transport</td><td>Youth</td></tr></table>
Tags/ Keywords	Recommend that you use keywords to describe the technology, science, sector, content or nature of the result and very importantly, keywords to denote potential uses or applications of your result. Please note that, by default, you will see in your submission form all keywords linked to the main project you had chosen for declaring this result. This is to help you get started. Feel free to remove those keywords irrelevant to this result.

Your result's contribution to Sustainable Development

Contribution to UN Sustainable Development Goals	Select max three from the list, <table><tr><td>GOAL 1: No Poverty</td><td>GOAL 2: Zero Hunger</td><td>GOAL 3: Good Health and Well-being</td><td>GOAL 4: Quality Education</td></tr><tr><td>GOAL 5: Gender Equality</td><td>GOAL 6: Clean Water and Sanitation</td><td>GOAL 7: Affordable and Clean Energy</td><td>GOAL 8: Decent Work and Economic Growth</td></tr><tr><td>GOAL 9: Industry, Innovation and Infrastructure</td><td>GOAL 10: Reduced Inequality</td><td>GOAL 11: Sustainable Cities and Communities</td><td>GOAL 12: Responsible Consumption and Production</td></tr><tr><td>GOAL 13: Climate Action</td><td>GOAL 14: Life Below Water</td><td>GOAL 15: Life on Land</td><td>GOAL 16: Peace and Justice Strong Institutions</td></tr><tr><td>GOAL 17: Partnerships to achieve the Goal</td><td>Not Applicable</td><td></td><td></td></tr></table>

Radical Innovation Breakthrough?	(Optional) Is it a Radical Innovation Breakthrough?
Are you a member of the 'World Alliance for 1000 Solutions'?	• Yes • No

Your result's influence on policy

Has your result had or do you expect it to have a significant influence on policy-making?	• Yes • No

Other information/data to share

Title (optional, one or more links to further information)	Open access publications, presentations, etc.
Link	URL

Result, Business Maturity and Exploitation Outlook

Result Maturity	TRL Level
Current Stage and Next Steps	More details/justification of the maturity.
Do you already have customers for this result?	• Yes • No
Number of existing customers	• 1-5 • 6-30 • 31-50 • 51-100 • 101-500

<table>
<tr><td></td><td>

- 501-1000
- >1000

</td></tr>
<tr><td>What type of customers/ users do you have?</td><td>Select all that are applicable,
<table>
<tr><td>Individuals</td><td>SMEs</td><td>Big corporations</td><td>Academia</td><td>R&T organisations</td></tr>
<tr><td>Public Institutions and Authorities</td><td>Governments</td><td>Commerce</td><td>Manufacturers</td><td></td></tr>
</table>
</td></tr>
<tr><td>Which Business Sectors do your customers mainly come from?</td><td>Select all that are applicable,
<table>
<tr><td>Agriculture and rural development</td><td>Banking and financial services</td><td>Borders and security</td><td>Budget</td><td>Business and industry</td><td>Climate action</td></tr>
<tr><td>Competition</td><td>Consumers</td><td>Culture and media</td><td>Customs</td><td>Digital economy and society</td><td>Economy, finance and the euro</td></tr>
<tr><td>Education and training; Employment and social affairs</td><td>Energy; Environment</td><td>EU enlargement</td><td>European neighbourhood policy</td><td>Food safety</td><td>Foreign affairs and security policy</td></tr>
<tr><td>Fraud prevention</td><td>Home affairs</td><td>Humanitarian aid and civil protection</td><td>Institutional affairs</td><td>International cooperation and development</td><td>Justice and fundamental rights</td></tr>
<tr><td>Maritime affairs and fisheries</td><td>Migration and asylum</td><td>Public health</td><td>Regional policy</td><td>Research and innovation</td><td>Single market</td></tr>
</table>
</td></tr>
</table>

	<table><tr><td>Sport</td><td>Statistics</td><td>Taxation</td><td>Trade</td><td>Transport</td><td>Youth</td></tr></table>
Unique value proposition	The unique selling proposition (USP), also called the unique selling point, or the unique value proposition (UVP) in the business model canvas, is the marketing strategy of informing customers about how one's own brand or product is superior to its competitors (in addition to its other values).
Do you have a scalable business model?	For a business model to be scalable, staffing requirements should grow in a strongly sublinear fashion and/or the revenue per customer (or end-user) should remain relatively stable. Grant-based sustainability is usually not scalable, nor is consulting. Franchising, licensing and platform business models can be.
Is your result replicable?	(Judgement call) • Yes • No
Please elaborate on the Replicability	Justification for a claim for replicability.
Is your result and your business model sustainable in the long term?	
Please elaborate on Sustainability	Justification to claim the solution is sustainable.
Are you targeting geographical markets?	Geographical market areas, or can also be global

Investor Corner

What level of investment (EUR) are you currently looking for?	Levels of funding sought: if a € sum is chosen.