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Executive Summary

This deliverable summarizes work carried out within the framework of ENVRINNOV Task 5.2. It analyses synergies, complementarities, gaps and opportunities for collaboration between the European Environmental and Earth System Research Infrastructures (ENVRI) community and other ESFRI domains. Its purpose is to support the development of the ENVRINNOV Innovation Roadmap (D6.1) by identifying transferable practices, innovation tools, governance models and collaboration mechanisms from relevant European Research Infrastructure (RI) initiatives.

The work combined desk research with stakeholder engagement activities, including participation in workshops, conferences, coordination meetings and interactions with related Horizon Europe projects.

The findings highlight strong synergies in areas such as innovation support structures, collaborative governance models, service catalogues, capacity building and interoperability frameworks. Common approaches include innovation offices, brokerage services, communities of practice, stakeholder-driven service development and integrated digital platforms.

At the same time, several common gaps were identified, including limited innovation governance structures, fragmented industry engagement, insufficient access to innovation expertise, fragmented service discovery mechanisms and limited use of user-centred design approaches. Opportunities were also identified to reduce duplication in service catalogue development and training activities.

Based on these findings, the deliverable recommends strengthening cross-domain collaboration, developing shared services and tools, improving interoperability, expanding capacity-building activities and ensuring the long-term sustainability of the ENVRI Innovation Hub (EIH) through integration with broader ENVRI and European Open Science Cloud (EOSC) developments.

Overall, the analysis demonstrates that ENVRINNOV can build upon substantial experience and the best practices from across the ESFRI landscape to strengthen innovation support, increase collaboration and enhance the impact of environmental RIs.

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1. Introduction

The objective of this deliverable is to report on the initiatives and activities undertaken by the ENVRINNOV project to identify and analyse synergies, complementarities, gaps and opportunities for collaboration within and across ESFRI domains in the area of innovation. This includes capturing and assessing best practices, innovation tools, governance approaches, service models and stakeholder engagement mechanisms developed through European Research Infrastructure (RI) initiatives.

By examining experiences from different scientific domains, these activities also support the development of the ENVRINNOV Innovation Roadmap (D6.1) and the ENVRI Innovation Hub (EIH). The analysis included in this deliverable also provides evidence-based recommendations on how successful approaches from other RI communities can be adapted and transferred to the ENVRI ecosystem.

The scope of the analysis covers projects and initiatives across the ESFRI landscape, with particular attention given to projects funded under the INFRADEV programme, including INFRADEV-05-01 projects operating alongside ENVRINNOV. The review also includes selected Horizon 2020 and Horizon Europe initiatives that have developed relevant practices in areas such as innovation management, industry engagement, catalogue development, interoperability, governance, capacity building and sustainability planning

The work contributes to Task 5.2 of the ENVRINNOV project and covers activities undertaken throughout the project period from Month 3 (M3) onwards. It considers both ENVRI-specific developments and lessons learned from other ESFRI domains in order to identify transferable approaches and promote cross-domain collaboration within the wider European RI landscape.

2. Methodology

The analysis was conducted using a combination of structured desk research and stakeholder engagement activities.

The desk research focused on identifying projects relevant to innovation support within the European RI ecosystem. The assessment covered a diverse range of ESFRI-related and Horizon-funded projects and initiatives, including ACCELERATE, AgroServ, CatRIS, CORBEL, ECCSELERATE, ENRIITC, ENVRI-Hub NEXT, ERIC Forum, IRISCC, RI-VIS, as well as the projects funded under the same call as ENVRINNOV – AARC TREE, FHERITALE and SPECTRUM. Together, these provided examples of innovation support structures, industry engagement models, interoperability frameworks, service catalogues and capacity-building activities relevant to the development of the EIH.

To complement the documentary analysis, stakeholder engagement activities were carried out. These activities were designed to validate findings from the desk research, identify emerging developments and gather practical insights from project representatives, RI managers, innovation practitioners and service developers. The engagement activities included:

- Outreach to other projects funded under the HORIZON- INFRA-2023-DEV-05-01 call.
- Participation in workshops, conferences and RI events, including those with participation of stakeholders from ESFRI, EOSC and ENVRI-related activities.
- Participation in training activities, webinars and dissemination events organised by related projects and stakeholder communities.

3. Key Findings

3.1 Mapping of ESFRI-level Projects, Practices and Tools

As part of the mapping and benchmarking activities, several relevant EU-funded projects and ESFRI-related initiatives were analysed to identify best practices, innovation tools, and approaches that support collaboration and innovation across RI ecosystems. The analysis focused on identifying transferable elements that could be adapted within ENVRINNOV to strengthen synergies across ESFRI domains. These are outlined in the subsections below:

➤ ACCELERATE project (2017-2021)

ESFRI LEVEL Project: The ACCELERATE project (doi:[10.3030/731112](https://doi.org/10.3030/731112)) is proposed to support CERIC (CENTRAL EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM) sustainability through activities of collaborative development of policies with other RIs, in particular new and forming ERIC entities. ACCELERATE assists the sustainability, relevance and effectiveness of the RI through preparation of frameworks for services to private and public entities, outreach to new scientific and industrial networks and geographical areas and a methodology for RI social impact assessment.

Key Results: Together with the RI partners, CERIC also carried out several intensive courses for the development of future RI managerial, IL (Industry Liaison) and TT (Technology Transfer) staff. The key lesson was that innovation ecosystems are not built primarily through infrastructure, but through people with brokerage, communication, partnership-building and commercialisation skills. It requires trained people whose job is to connect researchers, companies, investors and public actors. The programme was essentially an attempt to build that human capacity across European RIs (Angela Zennaro et al., 2021).

The ACCELERATE Handbook shows how CERIC aims to become more than a collection of scientific instruments. It is designed to function as a gateway between industry and advanced research facilities, helping companies solve technical challenges, access specialised expertise, develop new products and build collaborative innovation projects. Traditionally, an RI operates in transactional interactions. The company gets access, receives results, and the relationship ends. CERIC proposes a broader model where the company does not need to know:

- which facility to contact,
- which technology is needed,
- which experts are relevant,
- how to coordinate multiple facilities.

CERIC takes on that role and understands the problem, identifies relevant expertise, selects suitable facilities, and coordinates discussions.

The infrastructure becomes a "one-stop shop" or essentially incorporates the hub-and-spoke innovation brokerage model.

The Industrial Liaison Committee is also developed as CERIC's innovation assessment board, represented by two representatives per Partner Facility, which remain fully autonomous. This new committee provides the governance mechanism for the brokerage role that designs the technical response. This is much closer to consultancy and innovation support than to conventional infrastructure management (Angela Zennaro et al., 2018).

ENVRINNOV Relevance: This is transferable to the EIH as it can act as a broker and coordinator across ENVRIs with the Innovation Liaison Committee that evaluated the external challenges provided by the industry.

➤ AgroServ project (2022-2027)

ENVRI LEVEL Project: AgroServ (doi:10.3030/101058020) is an example of a cross-RI collaboration that allows researchers to access a vast array of over 140 scientific services from 11 leading European RIs. These services are designed to help tackle important issues related to agriculture, ecosystems, climate, soil, water, biodiversity, and food systems, offering a mix of physical access, data services, and advanced analytical tools.

Key Results: A key aspect of AgroServ is its emphasis on living labs and real-world experimentation. This hands-on approach enables researchers and stakeholders to collaborate directly, co-creating knowledge and solutions that align with the One Health approach, which recognises the interconnectedness of human, animal, and environmental health.

The project includes practical tools that facilitate stakeholder engagement and co-creation, such as methods for collecting data—think surveys and interviews—as well as participatory workshops like brainstorming sessions and Delphi method discussions. Tools for assessing needs, such as problem tree analysis and value proposition canvas, help ensure that the services provided meet the actual demands of users. Living lab methodologies and roadmapping tools further support user-centric innovation, while efforts to categorise services and enhance interoperability contribute to improved comparability and integration with broader initiatives such as EOSC.

ENVRINNOV Relevance: These insights are relevant for ENVRINNOV, as they offer practical examples of how to design and deliver integrated services that engage stakeholders and promote innovation.

➤ CatRIS project (2019-2021)

ESFRI LEVEL Project: CatRIS (doi: 10.3030/824173) focuses on enhancing the visibility and accessibility of RI services in Europe. It engages with various stakeholders, including researchers, industry leaders, and funders, to gather insights on their needs. Later, the recommendations for building the Catalogue of services were adopted by other projects and serve as references for service provider templates, site architecture, and questionnaires for gathering initial requirements.

Key Results: The main objective of CatRIS was to create a searchable catalogue of services offered by European RIs. By providing a single point of access to information on available services, CatRIS aimed to:

- Increase the visibility of RI services.
- Improve access for potential users.
- Foster European and international collaborations.
- Support greater use and impact of RIs.

The project conducted broad consultations with experts to define a coherent database structure, functionalities, and user interfaces. As a result, CatRIS has successfully onboarded over 600 services from more than 130 providers across various scientific disciplines.

ENVRINNOV Relevance: For ENVRINNOV, the development and evaluation of the EIH should therefore be guided by established UX (user experience) and usability principles in order to align with the findings that existing European RIs catalogues demonstrate the value of early stakeholder involvement, iterative

design and systematic evaluation in creating digital services that achieve broad adoption and long-term impact.

➤ CORBEL project (2015-2020)

ESFRI LEVEL Project: The CORBEL project (doi: [10.3030/654248](https://doi.org/10.3030/654248)) develop the tools, services and data management required by the BMS (Biological and Medical) RIs that will establish a sustained foundation of collaborative scientific services for biomedical research in Europe and embed the combined infrastructure capabilities into the scientific workflow of advanced users.

Key Results: The CORBEL Innovation Office (also called the Innovation Help Desk) was created to help research organisations collaborate with industry, manage innovation projects, and accelerate the translation of scientific discoveries into real-world healthcare solutions (CORBEL Project, n.d.). Europe produces excellent biomedical research, but many scientific discoveries never become products, medicines, diagnostics, or services that benefit society. Its mission was to act as:

- A real-time helpdesk for innovation and technology transfer questions, free of charge.
- A centre of expertise on intellectual property, legal issues, and business development.
- A facilitator for public-private partnerships.
- A provider of tools, templates, and best practices for collaboration.

The Innovation Office should continue as a European innovation broker. According to Deliverable D8.4, the future Innovation Office was not planned as a permanently funded central office with its own dedicated budget. Instead, the sustainability model was deliberately designed around embedding the service within EATRIS and financing activities through a combination of existing resources, projects and service-based funding, covering mainly the expenses of the core team that will consist of 2 or more business developers, 1 legal counsel and 1 regulatory expert (Abuja, Peter M et al., 2020).

ENVRINNOV Relevance: The project brings together ideas also raised in the ENVRI community for the creation of an Innovation office with resources. Furthermore, it proposes a sustainability and governance model for the newly established Innovation office to be implemented after the project, relevant also for the EIH.

In another deliverable, the CORBEL authors argue that the future business model of many life-science ERICs is not to act like laboratories for hire but to function as innovation platforms. Like the World Wide Web enabled Google and Amazon, RIs can enable new ecosystems of biotech, health, data and AI businesses. Their biggest economic impact may therefore come not from the services they directly sell, but from the new products, companies and collaborations that emerge around the data, expertise and networks they provide. This will reflect business model innovation enabled by the RIs as a center of the innovation ecosystem (Abuja, Peter M & Zatloukal, Kurt, 2018)

ENVRINNOV Relevance: In the framework of ENVRINNOV, the long-term societal impact of ENVRI may come less from providing access to instruments or datasets and more from enabling new climate-tech, biodiversity-tech, environmental AI, sustainability and resilience solutions that are built on top of the trusted data, expertise and networks that the RIs provide, and such matchmaking activities should be part of the offering of the EIH.

➤ ECCSELERATE project (2020-2023)

ESFRI LEVEL Project: The EU-funded ECCSELERATE project (doi: [10.3030/871143](https://doi.org/10.3030/871143)) focuses on increasing use and ensuring the long-term sustainable operation of the European Carbon Dioxide Capture

and Storage Laboratory (ECCSEL) ERIC. It addresses cost-effective sharing and use by industry and SMEs and develops marketing, access and service models. ECCSELERATE will also focus on increasing international collaboration and visibility, extending use for CO₂ utilisation technology developments and potential synergies, expanding ECCSEL ERIC membership and developing its national nodes.

Key Results: In D1.2 titled "Industrial Services model", the project team has developed a tailor-made portfolio of research and technology development services for CCS (Carbon Capture and Storage) to actively engage industry (including SMEs) that could be of interest for this report. The overall idea presented in ECCSELERATE is firstly the organisation of a workshop with industry representatives (categorised into groups depending on the sector, size, and products and having been asked about their needs) coming from the industrial sectors of interest to have feedback on their priorities and the most valuable data services and products the RI could provide.

Another relevant point that comes from D1.2 is the recognition of the importance of outreach, capacity building, and training activities. Those activities are useful, on the one hand, to showcase the success stories and explain the added value of services, and on the other hand, to provide training on practical examples about how to improve their business using the RI's services. In addition, it can serve to launch Joint Research Activities to complement the training activities and develop use cases for collaborating with the industry in a cross-sectoral way to develop technologies that can reach higher TRLs.

The report suggests that ECCSEL should not simply provide laboratory access. Instead, it should act as an innovation community builder (including activities such as scouting, brokerage, market intelligence and knowledge sharing by webinars and workshops). Companies want a trusted European platform that can connect stakeholders, share knowledge, organise collaborative research, develop skills and support innovation in carbon capture, utilisation and storage.

At the centre is the creation of the ECCSEL Industrial Engaged Community Research Program. The goal is to enable industry to develop and share high-quality knowledge, compare technologies, identify common challenges, and learn from demonstration projects and first-of-a-kind facilities. The report proposes a simple financial model combining government support, membership fees, EU projects, and national/regional funding. Unlike research projects, the community programme would not generate new intellectual property. Instead, discussions remain at a pre-competitive level, members gain access to shared knowledge, and participants receive internal reports and insights. This makes it easier for competitors to participate because commercially sensitive information does not need to be disclosed (ECCSELERATE, n.d.).

ENVRINNOV Relevance: ECCSELERATE provides an example of how RIs can combine service provision, industry engagement, training, brokerage, and community building into a coherent innovation framework. The project's approaches and lessons learned are transferable to ENVRINNOV and could support the further development of the EIH as a platform for innovation support, stakeholder engagement, and cross-sectoral collaboration.

➤ ENRIITC project (2020-2022)

ESFRI LEVEL Project: ENRIITC (doi: 10.3030/871112) aimed to establish a pan-European network of Industrial Liaison helping unlock the under-exploited innovation potential of the European RIs (all ESFRI domains) and maximise their societal and economic benefits across the whole innovation value chain.

Key Results: The main outcomes of the H2020 project ENRIITC are:

- The creation of a sustainable and integrated European network of ILOs and ICOs, which includes almost 500 network partners and 60+ associated partners, including physical campuses/hubs, permanent ILO/ICO network,

clusters, associations, Research and Technical Organisations (RTOs), Technical Infrastructures (TIs) and universities.

- The development of a new framework for providing services to RIs and industries, including the development of best practices and guidelines.
- The development of no “one-size-fits-all” innovation strategies for European RIs, industry-RI collaboration, for training and outreach towards the industry and a practical guide for the organisation of brokerage events.
- The development of a sustainable business model for the network, including the development of a governance structure and the identification of funding opportunities for future sustainability.

The roadmap developed during the project is composed of five main actions that are targeted to help nurture RIs' engagement with the industry via a core support environment:

- Establish a pan-European ICO/ILO network
- Adopt a set of core competencies for ICOs and ILOs.
- Specific key actions for review and implementation for each RI
- Building strategic alliance relationships
- Develop a European Research and Knowledge Exchange Strategy tailored for RIs

ENVRINNOV Relevance: The relevant novelty of the ENRIITC version of the roadmap is the introduction of a pan-European hub-and-spoke network managed by an “Innovation and Industry Services Central Support Hub”, which provides a coordinated structure for supporting RIs in engaging with industry. This approach is relevant for ENVRINNOV, as it demonstrates a scalable and transferable model for enhancing collaboration and innovation. EMSO-ERIC (Marco Galeotti), through its participation in ENRIITC and leadership of WP6 in ENVRINNOV, plays an important role in ensuring that relevant lessons learned, good practices, and successful approaches are transferred and considered in the development of the EIH.

- ENVRI-HUB NEXT project (2024-2027)

ENVRI LEVEL Project: The overarching goal of ENVRI-Hub NEXT (doi: [10.3030/101131141](https://doi.org/10.3030/101131141)) is to consolidate and advance the robust conceptual and technical structure established by the ENVRI-Hub to empower the ENVRI Science Cluster to provide interdisciplinary data-driven services. These services will support climate change research, including the development of mitigation and adaptation measures and strategies, and the assessment of climate change risks. Through this platform, ENVRI-Hub NEXT will facilitate the integration of the environmental sciences community into EOSC, guided by the concept of Essential Climate Variables.

ENVRI-Hub NEXT follows a collaborative governance approach that involves multiple ENVRIs working together within the ENVRI community. Rather than operating as a single infrastructure, it acts as a coordination and integration framework that enables common policies, standards and services across diverse research domains.

Key Results: One of the developments of ENVRI-Hub NEXT is the ENVRI Catalogue of Services (CoS). The catalogue was created to overcome the fragmentation of environmental research services and provide a single-entry point for discovering and accessing resources across ENVRIs. The catalogue is designed not simply as a directory of services but as a building block for the future EOSC Federation and a mechanism for connecting ENVRIs into a coherent digital ecosystem (Turco et al., 2026).

The ENVRI-Hub NEXT experience demonstrates several important principles that are directly relevant for the development of the innovation service catalogues and innovation support tools:

- Services should be described using common standards and terminology.
- Service catalogues should evolve from simple inventories into interactive platforms that support discovery, integration and reuse of services

ENVRINNOV Relevance: ENVRI-Hub NEXT should be viewed as a key strategic partner for ENVRINNOV. Its governance structures, catalogue methodologies, EOSC integration activities, and service management approaches provide valuable building blocks for the future development, integration, and sustainability of the EIH and its associated innovation services. The close involvement of the ENVRINNOV partner FZJ (Ulrich Bundke) in both initiatives helps ensure alignment, knowledge exchange, and the uptake of relevant results to support the long-term sustainability and operationalisation of the EIH.

- ERIC FORUM (2019-2022)

ESFRI LEVEL Project: The project aims at strengthening coordination and networking, reinforcing the informal ERIC network or its successor framework;

- Support the organisation of specific meetings, targeted thematic workshops focussing on shared challenges such as the development of internal procurement rules, harmonised reporting, VAT exemption practices, insurances and pensions policies and training of governance bodies representatives;
- Support ERICs in preparation, based on best practices;
- Support common communication and outreach activities and strengthen external representation of ERICs as a stakeholder in consultations and other policy actions that could affect them.

Key Results: The ERIC Forum initiative (doi: 10.3030/823798) contributes to the understanding of coordination and innovation within the ESFRI landscape through a set of activities dedicated to Innovation (WP6):

- The synergies between ERICs and the (Regional) Research and Innovation Strategies for Smart Specialisation (RIS3).
- The integration of ERIC development into pan-European infrastructures, particularly in the new European Open Science Cloud (EOSC).
- Some suggestions on how ERIC Forum Members can foster internationalisation.

The second activity concludes that ERICs can work together through large European digital platforms, focusing on the EOSC to create greater value. By integrating data, services and expertise, ERICs can support more open, collaborative and impactful science. The final goal is a European research system where information flows easily across disciplines and borders, helping researchers address major societal challenges more effectively than any single infrastructure could do alone.

ENVRINNOV Relevance: The importance of this is well represented in the ENVRINNOV project that aims to become a one-stop hub for tools and services outside of the data services provided by the ENVRI. In addition, the governance and sustainability model of the EIH is currently based on the incorporation of the EIH within ENVRI-Hub and its following transition to ENVRI EOSC Node (Juan Miguel González-Aranda & Cristina Huertas Olivares, n.d.).

According to another deliverable, the Intellectual Property (IP) is presented as an underdeveloped strategic asset in many ERICs, although present in 75% of their missions. Most ERICs protect some forms of IP

(especially trademarks, software and databases), but few actively generate significant revenue from their IP, possibly due to an understanding of the discrepancy with their mission of public-interest RIs with an open science structure. The principal recommendation is that ERICs should identify and protect valuable IP early, clarify ownership arrangements—particularly with host institutions (usually universities) essential for future commercialisation opportunities—and develop more structured approaches to licensing, technology transfer and value creation. Profit generation is not the primary mission of ERICs, but well-managed IPR can contribute to long-term sustainability and operational funding.

ENVRINNOV Relevance: In the framework of ENVRINNOV, this strengthens the business proposition of the EIH by offering shared resources of specialised personnel targeting this identified gap. Furthermore, this should enhance the co-development of innovative technologies and services. Following the recommendation about transforming IP into value should also facilitate engagement with the industry, a main stakeholder in the ENVRINNOV project (Lorna RYAN, n.d.).

➤ IRISCC project (2024-2028)

ENVRI LEVEL Project: IRISCC project (doi: 10.3030/101131261) is designed to tackle the pressing issues related to climate change by creating a new generation of integrated RI services that span various fields—including environment, climate, health, marine, and societal studies in order to better understand and manage the risks associated with climate change in Europe and beyond. Bringing together multiple ESFRI domains, it aims to improve interoperability, accessibility and usability of data and services for researchers, policymakers and wider stakeholders.

Key Results: The main outcomes of the project are:

- A user-focused Catalogue of Services, which serves as a one-stop shop for accessing vital data, models, observation infrastructures, and tools needed to assess climate risks effectively.
- Hands-on learning through Service Design Labs and Demonstrators, which showcase real-world applications of its services.
- Open Science and the FAIR principles (Findable, Accessible, Interoperable, Reusable), ensuring that the data and tools are available for everyone—researchers, policymakers, and various stakeholders—to utilise and build upon.
- Stakeholder engagement and planning for long-term sustainability

The IRISCC develops its Innovation Management Plan, built on ISO 56000 principles. This structured approach helps turn the project's outputs into practical and sustainable outcomes by identifying opportunities early and systematically tracking results. Each important outcome, known as a Key Exploitable Result (KER), is assigned to a dedicated “KER Champion” who advances and improves the KER and ensures it achieves meaningful scientific, social, and economic impacts.

ENVRINNOV Relevance: This integrated framework not only focuses on innovation, sustainability, and managing IP but also provides a transferable model for ENVRINNOV. It's especially useful for structuring innovation processes within the EIH, promoting co-design and continual feedback from stakeholders.

➤ RI-VIS project (2019-2022)

ESFRI LEVEL Project: The RI-VIS project (doi: 10.3030/824063) aims to increase the visibility of RIs to new communities in Europe and beyond. For this purpose, it created the RI-VIS Communication Toolkit that argues that European RIs need to communicate less about their internal structures without explaining them when the audience is not familiar with them and instead focus more on their value, impact and real-world benefits. Through clear language, storytelling, targeted communication and a common European approach,

RIs can become more visible, better understood and more effective at engaging researchers, industry, policymakers and the public (Barbara Pintar & Rita Costa Abecasis, 2020).

Key Results: Some of the resources included are:

- ready-made presentation slides explaining what an RI is, why they matter and how they contribute to innovation and society.
- Content planning tool proposing different types of social media content such as user stories, success stories, event promotion, behind-the-scenes content, etc.
- Storytelling templates instead of technical descriptions
- All of that is connected through a 7-step social media strategy framework

ENVRINNOV Relevance: In the context of ENVRINNOV, this might be an important asset in order to adapt the language of the RIs to a more common language of the business, which will accelerate the possibility of collaboration.

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- AARC TREE project (2024-2026)

ESFRI LEVEL Project: An additional relevant initiative supporting cross-domain interoperability and digital integration is the AARC TREE project (doi: 10.3030/101131237). The main objective is to develop common strategies for the future evolution of technologies and services across RIs, with a particular focus on secure and interoperable access management. The project addresses the need for effective Authentication and Authorisation Infrastructures (AAs), enabling users to access distributed research services across multiple organisations through federated identity management. By promoting the adoption of the AARC Blueprint Architecture (BPA), AARC TREE provides a structured framework for identity and access management and adoption of interoperability, which helps reduce fragmentation and facilitate integration across various thematic research domains

Key Results: The project takes a holistic approach by combining technical advancements, policy frameworks, and engagement with stakeholders. It conducts landscape analyses to understand the emerging demands for interoperability, identifies gaps, and creates guidelines. To help with implementation, it also provides toolkits and validation environments.

The project also emphasises open community engagement and co-development, with its activities carried out through openly accessible platforms and collaborative processes. Pilot implementations and use-case analyses demonstrate the applicability of its solutions across diverse research environments, while its architecture has already been widely adopted as a reference model within major European and international initiatives, including the European Open Science Cloud and several ESFRI cluster AAs. However, the project has also identified some challenges, such as the need for clearer compliance criteria, simplified guidelines, and enhanced user experience, particularly in areas like federated access and identity management (AARC I Authentication and Authorisation for Research and Collaboration, n.d.; X. Salazar et al., 2024) .

ENVRINNOV Relevance: From a strategic perspective, AARC TREE provides important contributions to addressing fragmentation in the RI landscape, albeit at the level of digital access and identity management. While ENVRINNOV focuses on innovation processes, service development, and ecosystem integration, AARC TREE complements these efforts by delivering horizontal services that enable secure and interoperable access to distributed resources.

The project highlights the importance of community-driven approaches that could inform the design of the ENVRINNOV Innovation Roadmap. Particularly, the idea of a collaborative and modular community framework could significantly enhance communication, coordination, and long-term sustainability within the ENVRI ecosystem (AARC, n.d.-a, n.d.-b).

➤ FHERITALE project (2024-2027)

ENVRI LEVEL Project: The FHERITALE project (doi: 10.3030/101138672) brings together various domains in research, particularly focusing on the effects of artificial materials on health and the environment. This includes materials like microplastics, nanoplastics, engineered substances, and biotechnological innovations. The main goal of FHERITALE is to map existing RIs services, identify where improvements are needed, and create strategies that enhance service coordination across different fields. By adopting a “One Health” approach, the project aims to connect environmental, food, and health research into a comprehensive framework.

Key Results: A key contribution of FHERITALE lies in its methodological framework for mapping and characterising RI services. The project provides structured guidelines for analysing services across domains, with a particular focus on how existing capabilities can respond to emerging scientific challenges. Findings indicate that the main challenges are not necessarily related to the absence of individual technologies, but rather to the lack of integration of these technologies into coherent, end-to-end services capable of addressing complex, cross-domain research questions. For example, in the area of environmental monitoring, detection of MNPs, fate & degradation, including technologies such as FTIR, LC-MS, and imaging tools.

ENVRINNOV Relevance: FHERITALE also incorporates a Technology Readiness Level (TRL)-oriented perspective, assessing not only the availability of services but also their maturity. It can serve as a source of inspiration for developing innovation tools within ENVRINNOV. By integrating concepts of service readiness into innovation planning, the project can help align service maturity with user requirements and technological development pathways. This alignment strengthens ENVRINNOV's ability to focus on strategic planning and prioritise innovation efforts effectively.

➤ SPECTRUM project (2024-2026)

ESFRI LEVEL Project: The SPECTRUM project (doi: [10.3030/101131550](https://doi.org/10.3030/101131550)) is an important initiative that focuses on addressing the growing challenges of managing large amounts of data and the high computational requirements in fields like High Energy Physics (HEP) and Radio Astronomy. Its main objective is to develop a Strategic Research, Innovation and Deployment Agenda (SRIDA), alongside a Technical Blueprint for a European compute and data continuum. This vision aims to enable federated, large-scale data and computing infrastructures that can support next-generation scientific collaborations across disciplines.

Key Results: A central contribution of SPECTRUM is the establishment of a Community of Practice (CoP), which brings together scientists, infrastructure providers, and technical experts to collaboratively identify future needs, challenges, and solutions. The CoP acts as an open forum—a Knowledge Hub—that is divided into several working groups, fostering dialogue and knowledge sharing (Boccali, 2025).

From a strategic perspective, SPECTRUM emphasises the importance of co-design approaches, where infrastructure development is closely aligned with user needs, as well as the growing relevance of sustainability considerations, including energy efficiency and optimisation of computing resources. The project also highlights the importance of investing in skills development and career pathways to support the evolution of data-intensive infrastructures.

ENVRINNOV Relevance: For ENVRINNOV, the SPECTRUM model is particularly relevant due to its emphasis on community-driven efforts and strategic planning. The Community of Practice and Knowledge Hub offer valuable frameworks for collaboration, knowledge sharing, and cross-domain coordination. While SPECTRUM is primarily centred on computing and data infrastructures, the principles it advocates—such as interoperability, user-centred design, and coordinated strategic planning—strongly resonate with ENVRINNOV’s goals in developing innovation ecosystems. These insights can help enhance collaboration frameworks, support the creation of shared platforms, and contribute to the formulation of long-term, sustainable strategies within the ENVRI landscape.

3.2 Engagement Actions & Outcomes

The engagement activities planned, pursued and/or implemented by ENVRINNOV provided opportunities to exchange experiences, discuss challenges and gather feedback from a range of relevant stakeholders, including RI managers, service providers, innovation practitioners and potential users. Feedback received during consultations helped to assess the relevance, usability and transferability of identified approaches and highlighted stakeholder expectations regarding innovation support services, governance arrangements, service catalogues and digital platforms. A summary of key engagement actions pursued during the ENVRINNOV project, along with their focus and outcomes, is outlined below.

PROJECTS

➤ HORIZON-INFRA-2023-DEV-01-05

ENVRINNOV initiated engagement with the Coordinators for all other projects funded under the INFRA-DEV-05-01 call via email and organised the first virtual meeting for the group on 24 May 2024, which included participation by project coordinators and representatives. During this meeting, participants shared information on their project scopes and timelines and began discussing possible areas for collaboration.

While this initial exchange was positive, it became clear that there wasn't much immediate overlap in project focus or areas for collaboration. Nevertheless, one common interest emerged: many projects were conducting a landscape analysis to identify existing services and pinpoint gaps and stakeholder needs within the RI landscape.

In the second half of the ENVRINNOV project, new efforts were made to resume communication individually with each project coordinator. Despite efforts to establish a structured cross-project working group for INFRA-DEV-05-01 in 2026, engagement remained somewhat limited due to the differing scopes and timelines of the projects involved. To navigate these challenges, desktop research was undertaken, making use of publicly available information, such as project deliverables (presented in section 3.1 of this deliverable). This research helped identify various innovative practices, tools, and service models across different domains, paving the way for cross-domain collaboration.

➤ ENVRI-Hub NEXT project

In this context, particular attention was given to ongoing ENVRI-related initiatives, notably the ENVRI-Hub NEXT project (2024–2027). ENVRI-Hub NEXT aims to consolidate and further develop the conceptual and technical framework of the ENVRI-Hub, enabling the ENVRI Science Cluster to deliver interdisciplinary, data-driven services addressing climate change challenges, including support for mitigation and adaptation strategies, as well as climate risk assessment. Through its platform, ENVRI-Hub NEXT facilitates the integration of ENVRI into the European Open Science Cloud (EOSC), in line with the concept of Essential Climate Variables.

In the context of ENVRI-Hub NEXT, ENVRINNOV contributed to and followed closely two dedicated coordination discussions focusing on:

➤ Governance model of the ENVRI community

The governance-related exchanges highlighted the importance of establishing a coherent organisational structure, in which the EIH will be embedded in the ENVRI-HUB as a cross-cutting component, linking innovation activities with governance, policy, and operational structures. Rather than functioning as a standalone entity, innovation is increasingly seen as something that should permeate all layers of the ENVRI ecosystem. The idea of establishing a dedicated innovation-focused structure or working group was raised, which could act as a transversal mechanism connecting different parts of the ENVRI community while supporting alignment with strategic and policy-level activities. Particular attention is being paid to the distinction between digital services, which are increasingly aligned with EOSC frameworks, and non-digital innovation services such as training, consultancy, and capacity building.

➤ Integration of EIH innovation services into the ENVRI-Hub CoS

Alongside governance discussions, attention was also given to the integration of EIH innovation services into the ENVRI-Hub CoS. Initial exchanges with CoS developers suggested that such integration is technically feasible. Each of these services could be described as an individual entry, improving discoverability and enabling users to access a broader range of support through a unified interface. Furthermore, alignment with EOSC requirements and service classification models will need to be ensured to support interoperability and consistency across platforms.

These discussions directly inform the development of the EIH and its role within the broader ENVRI ecosystem. They highlight the need for a flexible and modular approach, allowing innovation activities to evolve alongside governance structures, while ensuring integration with existing platforms and services. They also underline the importance of linking governance and operational dimensions, so that innovation is not only strategically recognised but also effectively implemented and accessible to users. The outcomes of these exchanges reinforce the need for a bidirectional approach, where governance structures support innovation processes, and innovation activities contribute to shaping governance and strategy.

➤ IRISCC Workshop

Further coordination was initiated with relevant Horizon Europe projects, most notably the IRISCC project, particularly in areas related to innovation management, capacity building, and training across ESFRI clusters. In 2025, several targeted interactions took place, one of which was the IRISCC annual meeting in Marseille, which included targeted exchanges between ENVRINNOV partners (CNRS and The Cyprus Institute) and IRISCC representatives, including the team from UHEL responsible for training activities. These exchanges explored opportunities for collaboration, including the organisation of joint side events and mutual participation in training and dissemination activities. As a result, ENVRINNOV was invited to contribute to IRISCC outreach efforts, including participation in a dedicated webinar.

The [webinar](#) took place online on 29 October 2025 under the initiative “Turning Research Services into Impact: Managing Key Exploitable Results in IRISCC”. The event brought together 29 participants from 16 organisations across 7 countries, representing the broader ENVRI and RI community. The webinar focused on practical approaches to identifying, managing, and exploiting KERs, highlighting their importance in transforming research outputs into tangible impact.

ENVRINNOV contributions to the webinar emphasised the development of the EIH, including its role as a central platform providing access to innovation tools, training resources, and service catalogues. The ENVRINNOV Innovation Toolbox was also presented as a key resource for supporting innovation management, alongside planned training activities focusing on intellectual property, technology transfer, and innovation processes.

This interaction reinforced the importance of coordinated efforts across projects to maximise impact. It also demonstrated the potential for aligning tools, methodologies, and training activities across ESFRI domains, thereby contributing to stronger synergies within the European RI landscape.

➤ Session with GEORGE Project

Another highlight of these activities was ENVRINNOV's contribution to the EGU General Assembly 2026 (Vienna, Austria), where innovation in environmental monitoring was showcased. In collaboration with the GEORGE project, ENVRINNOV co-organised a dedicated session entitled “Advancing Environmental Sciences with Innovation and Research Infrastructures” (7 May 2026), bringing together experts from across the ENVRI community. The session addressed multiple environmental domains—including atmospheric, marine, terrestrial, and solid earth sciences—and explored how emerging technologies, advanced services, and cross-domain collaboration are helping RIs tackle key global challenges such as climate change, biodiversity loss, water scarcity, and ocean degradation. This broader perspective enabled valuable interdisciplinary exchange and contributed to strengthening collaboration across RIs, in line with ENVRINNOV's objectives (ENVRI Community, 2026a).

The session also showcased the work of the GEORGE project, a collaboration involving EMSO ERIC, EURO-ARGO ERIC, ICOS ERIC, alongside research institutions, universities, and industry partners. GEORGE focuses on developing innovative technologies and methodologies to improve observations of ocean carbon fluxes and carbonate chemistry, addressing critical gaps in marine monitoring capabilities. Beyond technological developments, discussions highlighted the growing importance of service-oriented approaches within ENVRI, including Trans-National Access (TNA), FAIR data practices, interoperability frameworks, cloud-based infrastructures, and user-centred service design.

From an innovation perspective, GEORGE provides valuable examples of technology development, validation, and integration within RIs, making it relevant for ENVRINNOV as a source of best practices and innovation case studies. The project's results offer insights into the full innovation lifecycle, from early-stage technological development to deployment within operational RI environments (GEORGE project, 2025).

The session demonstrated a potential for cross-domain innovation and collaboration within the ENVRI ecosystem by bringing together multiple scientific domains in a shared innovation-focused setting and promoting the uptake of innovative solutions.

EVENTS

➤ ESFRI Roadmap 2026 InfoDay

A key milestone in this context was participation in the ESFRI Roadmap 2026 InfoDay (8 October 2024, Brussels), which marked the launch of the process for updating the ESFRI Roadmap. Participants received detailed guidance on the requirements, evaluation criteria, and procedures for inclusion of new RI projects, as well as updates on the monitoring of existing ESFRI projects. The event, which was attended by the ENVRINNOV consortium, provided an opportunity to engage directly with ESFRI stakeholders, RI representatives, and European Commission officials involved in the Roadmap process. This engagement contributed to a better understanding of strategic priorities at the European level and provided important context for aligning ENVRINNOV activities with evolving ESFRI policy and roadmap developments.

➤ EOSC Symposium 2024

ENVRINNOV also participated in the EOSC Symposium 2024 (21 October 2024), a key event shaping the future of the European Open Science Cloud (EOSC) in the context of its post-2027 evolution. Participation in this event provided valuable insights into the future direction of EOSC and highlighted opportunities for

alignment of ENVRI activities with emerging European data and service frameworks. It also opened possibilities for stronger coordination with other projects, including potential joint visibility actions and collaboration on integrated service development (e.g. ENVRI-HUB NEXT).

➤ Week of Innovative Regions in Europe

ENVRINNOV was showcased at the Week of Innovative Regions in Europe (WIRE) Conference (13-14 November 2024), where Marina Papageorgiou, ENVRINNOV Coordinator and Managing Coordinator of the Climate and Atmosphere Research Centre (CARE-C) of The Cyprus Institute, participated in the panel discussion “Success Stories from Winning Projects”. The session provided an opportunity to present ENVRINNOV's objectives and early achievements to a broad audience of regional innovation stakeholders, fostering visibility and creating opportunities for further networking and collaboration across the European innovation ecosystem (National Research, Development and Innovation Office, 2024).

Following the interaction during the conference, exploratory discussions were initiated with CERIC-ERIC and continued through a follow-up online meeting. The discussions focused on innovation support processes, common challenges faced by RIs, and approaches that could be relevant for ENVRINNOV. CERIC-ERIC shared its experience in developing innovation services and engaging scientific users and RI members over the past several years, providing best practices on the expansion of innovation offerings. These exchanges contributed to mutual learning and helped identify potential areas for future collaboration and knowledge sharing.

➤ 2025 Research and Technology Infrastructures Summit

The Managing Coordinator of CARE-C at The Cyprus Institute and Coordinator of the ENVRINNOV project participated in the 2025 Research and Technology Infrastructures (RTI) Summit, entitled “A Research and Technology Infrastructures Ecosystem for Breakthrough Science and Innovation.” The event was held in the framework of the Danish Presidency of the Council of the European Union and took place on 22–23 October 2025 in Copenhagen, Denmark.

The summit brought together industry leaders, policymakers, research organisations, and innovation stakeholders from across Europe to discuss the future of Research and Technology Infrastructures (RTIs) and contribute to the development and implementation of the new European strategy in this field. The event highlighted strong complementarities with ENVRINNOV's objectives of fostering innovation, technology transfer, and science–industry cooperation. At the same time, discussions identified the need for stronger technology transfer mechanisms, enhanced collaboration between RIs and industry, and greater support for innovation uptake across the European research ecosystem (EMME-CARE, 2025).

➤ 96th ESFRI Forum Meeting

Prof. Jean Sciare, Director of the Climate and Atmosphere Research Centre (CARE-C) at The Cyprus Institute and coordinator of the ENVRINNOV project, delivered a presentation in the 96th ESFRI Forum Meeting (22–23 June 2026, Nicosia, Cyprus) highlighted how ENVRINNOV outputs—particularly the EIH and the ENVRI Innovation Roadmap—align with ESFRI's strategic objectives by strengthening coordination across RIs and enhancing their capacity building by providing structured innovation support mechanisms, which complement ESFRI's high-level strategy with operational tools and approaches. The EIH can therefore be seen as a practical implementation layer supporting ESFRI's vision, particularly in translating policy-level objectives into actionable tools and services within the ENVRI domain.

Importantly, the ESFRI Forum also highlighted priorities related to long-term sustainability, governance clarity, and integration across domains, which are directly relevant to ENVRINNOV. This confirms the

importance of positioning the EIH not only as a standalone platform, but as an integrated component within the wider ENVRI and ESFRI ecosystems (ENVRI Community, 2026b).

3.3 Future Engagement Opportunities

In addition to the synergies and complementarities already identified and pursued through the stakeholder engagement activities outlined in section 3.2, ENVRINNOV is exploring opportunities for future collaboration with several RI and innovation initiatives to support the establishment and further development of the EIH after the end of the project. These are presented in Table 1 below.

Table 1: Potential Future Synergies

Project	Opportunity for Synergies and Joint Actions
ACCC - Atmosphere and Climate Competence Center	Exchange of best practices on stakeholder engagement and co-design approaches, particularly through ACCC's annual Impact Week, which highlights research results, applications and innovation-driven climate and air-quality solutions.
AI4ATM - Artificial Intelligence systems for enhancing sensing technologies and scientific discoveries	This project will develop and implement Artificial Intelligence (AI) technology to improve the quality of data generated at environmental research stations. The project development and evaluation will be carried out mainly at the Station for Measuring Ecosystem-Atmosphere Relations (SMEAR stations) network nationally and internationally. The outcome of the project will lead to the automation of the SMEAR infrastructure, where scientists' involvement in performing repetitive tasks can be minimised, and data quality improved. This will be achieved by AI automation of data quality control and instrument calibration; these time and error-prone tasks are currently performed manually by scientists. The AI implementation will be beneficial on a global scale as the number of research stations grows across the world.
FunSNM – Fundamental Principles of Sensor Network Metrology	Knowledge exchange on harmonisation and standardisation of sensor networks for air quality applications.
JOHN – Joint Operations for monitoring anthropogenic and Natural GHG emissions and sinks	The project supports and strengthens the value chains that connect observations, data synthesis, analysis and reporting. Today, global knowledge of climate-controlling greenhouse gas cycles relies on a complex network of local, national and continental programmes, including those contributing to the Global Carbon Project. Although these systems provide authoritative annual information on the global carbon cycle, some of their underlying value chains are fragile or declining in quality.
ATMOSERV: ATMOSpheric research infrastructure SERVices for curiosity-driven research of atmospheric chemistry and dynamics	ATMO-SERV, coordinated by ACTRIS ERIC, brings together all the major European atmospheric research infrastructures (ACTRIS, ICOS, IAGOS, EISCAT_3D, SIOS), as well as several complementary networks (ARISE, ASCENT) and the health-focused infrastructure EIRENE. The project also includes international access partners in South Africa, India, Lebanon, Brazil and the United States. For the first time, this consortium covers the full range of atmospheric observations, from the Earth's surface to the upper atmosphere, whilst also incorporating research on human exposure.
ACTRIS NEXT	Developing new services fostering ACTRIS innovation potential and new user communities (i.e.: health, energy sector, etc.)
EOSC MESH: Connecting Nodes to Advance the EOSC Federation	The project supports this with 7 cross-node, international use cases from Environmental Science, Health, Social Science and Humanities, and Multidisciplinary Science. Users will be involved in co-design through requirement elicitation, piloting, integration and validation.
FHERITALE	Participation in the project's final meeting. The meeting will take place on 20 th November 2026

4. Synergies, Gaps, Complementarities and Actions

The mapping and stakeholder engagement activities revealed a number of common approaches, challenges and opportunities across ESFRI domains and related Horizon Europe projects. Although the analysed initiatives differ in terms of scientific focus, maturity and target communities, several recurring patterns emerged regarding governance, innovation support, service development, interoperability and capacity building. These findings provide a valuable evidence base for the development of the final ENVRI Innovation Roadmap and the EIH.

4.1 Synergies

The identified synergies are summarised in Table 2.

Table 2: Synergies with Projects from the Wider ESFRI Domains

Category	Projects/Initiatives	Key Synergy	Relevance for ENVRINNOV
Organisational	ENRIITC, ACCELERATE, CORBEL, ECCSELERATE	Innovation offices, liaison networks, brokerage services	Model for ENVRI Innovation Hub coordination
Governance	ECCSELERATE, SPECTRUM, AARC TREE, ERIC Forum	Communities of practice and collaborative governance	Innovation embedded in governance structures
Innovation Processes	IRISCC	Structured innovation lifecycle	Framework for innovation management and assessment
Service Catalogues	CatRIS, ENVRI-Hub NEXT, IRISCC, AgroServ	Standardised and interoperable service catalogues	Basis for EIH service catalogue
Capacity Building	ECCSELERATE, ACCELERATE, AgroServ, IRISCC, RI-VIS, FHERITALE	Training, mentoring and communities of practice	Shared training resources and skills development
Technical	AARC TREE, ENVRI-Hub NEXT	AAI, interoperability and EOSC integration	Technical backbone for EIH services

The strongest organisational synergies recognise the need for dedicated innovation support mechanisms. These projects have developed different forms of innovation offices, industry liaison networks, brokerage services and stakeholder engagement structures. Although implemented in different scientific domains, they share a common objective: facilitating interaction between RI and external stakeholders, particularly industry and innovation actors. These experiences provide valuable examples for the future operation of the EIH as a coordination and brokerage mechanism across the ENVRI ecosystem.

At the governance level, several initiatives demonstrate the value of collaborative and distributed governance approaches through the establishment of communities of practice, expert groups and collaborative structures that facilitate knowledge exchange and coordination. These approaches highlight the importance of embedding innovation activities within broader governance frameworks rather than managing them as isolated actions.

Innovation management methodologies can also inform the development of innovation management processes within the EIH and support a more systematic approach to innovation across ENVRI.

Another major area of synergy concerns service catalogues and digital platforms. All of the projects demonstrate the value of making services visible, accessible and interoperable through user-oriented catalogues and standardised descriptions. These initiatives provide practical lessons regarding service classification, stakeholder consultation, usability and integration with EOSC-related infrastructures. Their

experiences are relevant for the future development and integration of EIH services within the ENVRI-Hub CoS.

Capacity building is another prominent area of convergence. Multiple projects recognise that innovation depends not only on infrastructure and technology but also on people. Training programmes, mentoring activities, communities of practice and targeted capacity-building initiatives appear throughout the analysed projects. These experiences provide a strong basis for enhancing the transferable training resources and knowledge-sharing activities within ENVRINNOV.

Finally, important technical synergies exist around interoperability, authentication and federation services, demonstrating how they can support distributed service provision and integration within EOSC. These developments provide important technical foundations for the future scalability and sustainability of the EIH

4.2 Gaps

The analysis also identified several gaps that are insufficiently addressed across the current RI landscape, summarised in Table 3.

Table 3: Identified Gaps in the Current RI Landscape

Gap	Description
Innovation Governance	Lack of permanent innovation governance structures
Industry Engagement	Fragmented engagement with industry and SMEs
Innovation Expertise	Limited access to IP, business and exploitation support
Service Discovery	Fragmented service catalogues and access points

One of the most significant gaps relates to innovation governance. Although innovation is frequently mentioned as a strategic priority, relatively few infrastructures have established permanent governance structures specifically dedicated to innovation management, technology transfer and stakeholder engagement. Innovation activities often remain project-based and dependent on temporary funding mechanisms.

Industry engagement represents another persistent challenge. While many projects have developed valuable approaches for engaging companies and SMEs, activities remain fragmented and unevenly distributed across domains. Stakeholders repeatedly highlighted the difficulty of identifying relevant entry points and support structures within RIs.

A further gap concerns access to innovation expertise. Intellectual property management, business development, market assessment and exploitation support remain specialised competences that are not always available within individual RIs. This creates barriers to transforming research outputs into broader societal and economic impact.

Service discovery also remains fragmented despite considerable efforts toward service catalogues and marketplaces. Potential users still face challenges in identifying relevant services and navigating multiple catalogues that often use different formats and classifications.

The abovementioned further highlight the added value from the establishment and long-term operation of the EIH, as a means to address these gaps for the ENVRI, which is planned to be implemented through the ENVRI Innovation Roadmap being developed by the ENVRINNOV project.

4.3 Complementarities

The analysis also identified two key areas where ongoing initiatives are pursuing closely related objectives, creating opportunities for greater coordination and knowledge sharing across the RI landscape (Table 4). These areas highlight the potential to build complementarities, strengthening the overall impact of innovation support activities, and as such both of which have already been pursued during the ENVRINNOV project.

Table 4: Identified Complementarities in the Current RI Landscape

Complementarity	Description
Service Catalogues	Multiple catalogues with partially overlapping functions across projects
Training Activities	Parallel capacity building programmes by individual projects

The first area of joint complementarity is the service catalogues. Multiple initiatives have developed platforms aimed at improving the visibility and accessibility of services. While their target audiences and scientific domains may partially differ, many of these platforms perform similar functions. This presents an opportunity to promote interoperability, exchange good practices, and explore mechanisms for connecting existing catalogues, thereby enhancing user access and reducing fragmentation across the ecosystem. This has already been pursued by the ENVRINNOV project through close collaboration with the ENVRI-Hub NEXT project, particularly regarding the integration of innovation-related services into the ENVRI CoS as part of the ENVRI-HUB. Discussions have focused on joint planning of long-term governance and sustainability mechanisms, ensuring that innovation services can be embedded within existing ENVRI-Hub structures rather than developed as a parallel system.

A second area of complementarities relates to training and capacity-building activities. Many projects independently organise workshops, webinars, training materials and stakeholder engagement initiatives. Although these activities are valuable, stronger coordination could increase efficiency, improve visibility and avoid unnecessary duplication of effort. Such collaboration can help create a more connected innovation support ecosystem while maximising the value of existing investments and efforts. ENVRINNOV has already pursued this through its collaboration with the IRISCC project, including joint planning and participation in training and dissemination activities focused on innovation management, KERs, IP, and impact generation. Furthermore, several discussions occurred with ENVRI-HUB NEXT Training WP, but the timing and content of the planned training activities did not fit to organise a joint event. Furthermore, ENVRINNOV has adopted an open approach to capacity building by making training activities available to the wider ENVRI community and by integrating training resources, best practices, and guidance materials within the EIH and Innovation Toolbox. This creates opportunities for the long-term reuse of training assets and promotes a shared learning environment across RIs and ESFRI domains.

4.4 Actions for the ENVRI Innovation Roadmap

Based on the conducted desk research and mapping, extensive stakeholder engagement actions, and identified synergies, gaps and complementarities, several recommendations emerge for the development of the ENVRI Innovation Roadmap and the long-term evolution of the EIH.

➤ Strengthening Cross-Domain Collaboration

Cross-domain collaboration will be further strengthened by building on existing ESFRI and Horizon Europe networks. Regular exchanges, joint workshops, collaborative demonstrators and common working groups would promote knowledge sharing and facilitate the transfer of good practices between scientific domains.

The analysis demonstrates that many challenges faced by ENVRI are shared by other ESFRI communities. The EIH is therefore well positioned to act as a connector between domains, allowing the ENVRI community to benefit from existing experiences while contributing environmental perspectives and expertise to the broader European RI landscape.

➤ Development of Shared Services and Tools

The development of common innovation support services is another priority recognised by the ENVRI Innovation Roadmap. Rather than creating domain-specific solutions for every challenge, EIH leverages existing tools and adapts proven methodologies developed by other initiatives.

Particular opportunities exist for shared resources related to innovation management, stakeholder engagement, intellectual property, service development and business support. Reusable tools reduce costs, improve interoperability and strengthen collaboration across the ENVRI community.

➤ Reducing Fragmentation and Overlaps

The EIH contributes to reducing existing fragmentation by acting as a coordination mechanism rather than creating additional standalone services.

Efforts focus on aligning service descriptions, metadata structures and catalogue architectures with existing initiatives. Interoperability and integration are prioritised over duplication. This aligns with the plans of incorporating EIH in ENVRI-Hub and broader European ecosystems of the EOSC.

➤ Capacity Building and Knowledge Sharing

The findings clearly demonstrate the importance of capacity building as an enabling condition for innovation. The EIH therefore establishes a structured programme of training, mentoring and peer-learning activities even after the end of the ENVRINNOV project.

Priority themes include innovation management, technology transfer, IP, stakeholder engagement and entrepreneurial skills. Building a community of practice around innovation within the ENVRI ecosystem could further strengthen collaboration and facilitate continuous learning.

➤ Long-Term Sustainability

Stakeholders consistently identified long-term sustainability as a critical success factor.

The EIH will be embedded within existing ENVRI-Hub governance structures while maintaining a strong link with EOSC-related developments. The establishment of sustainable operational models, combined with clear value propositions for different stakeholder groups, is a main priority within the ENVRI Innovation Roadmap and will be essential for ensuring continuity beyond project funding.

5. Conclusion

The analysis demonstrates that considerable expertise and experience already exist across the ESFRI landscape regarding innovation support, stakeholder engagement, governance, service development and capacity building. Numerous projects have developed valuable tools, methodologies and organisational models that can be adapted and transferred to the ENVRI context.

The findings also reveal a growing convergence across domains around common priorities such as innovation management, service interoperability, industry engagement and sustainability. At the same time,

several persistent gaps remain, particularly in relation to innovation governance, access to specialised innovation expertise and long-term sustainability mechanisms.

The EIH is well positioned to address these challenges by acting as a coordinating platform that connects existing initiatives, facilitates knowledge exchange and supports innovation processes across the ENVRI community.

By building on successful experiences from other domains, avoiding duplication of effort and promoting interoperability, the EIH can contribute to a more connected and effective European innovation ecosystem. This approach will not only strengthen the ENVRI community but also support broader ESFRI objectives related to scientific excellence, societal impact, innovation capacity and long-term sustainability.

6. Annex: Stakeholder Engagement Activities

This annex presents a selection of images from stakeholder engagement activities attended or organised by ENVRINNOV. These events contributed to strengthening collaboration with the European RI community, facilitating knowledge exchange, and identifying opportunities for synergies, innovation uptake, and cross-domain cooperation.



Figure 1: Image from the WIRE Conference 2024, November 2024



Figure 2: Image from the RTI Summit, October 2025





WEBINAR

Key Exploitable Results Management

Turning Results into Impact: Master KERs Management and Reporting

DATE & TIME

29 29 October 2025
 11:00-12:00 CET

HOW TO JOIN

📍 Online
 Link will be sent upon registration

Figure 3: Image from the webinar poster: Key Exploitable Results Management. October 2026



Figure 4: Image from ENVRINNOV and GEORGE Showcase Cross-Domain Innovation at EGU2026, May 2026



Figure 5: Image from ENVRINNOV at the 96th ESFRI forum meeting, June 2026

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