

First biennial Full Report of the Co-programmed European Partnership EOSC for the period 01/06/2021 - 30/06/2023

Please note: For Additional activities, the reporting period is 01/06/2021-31/12/2022.

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1. Introduction

1.1 Summary of the main activities and achievements

The Horizon Europe Co-Programmed European Partnership for EOSC (the ‘EOSC Partnership’) was established in 2021 with a Memorandum of Understanding (MoU) between the EU, represented by the European Commission (EC), and the EOSC Association (EOSC-A) representing its constituent entities.

The EOSC Partnership was established as an outcome of the work of the precursor EOSC governance in place from 2019-2020.

The EOSC-A, incorporated as the EOSC Association AISBL in July 2020, is a member-supported organisation with 250 Member and Observer organisations distributed across 36 European countries, Israel and Canada. More than 50 percent of the EOSC-A membership base is composed of research-performing organisations, while some 30 percent are service providers for research, and around 10 percent are research-funding organisations. The remaining 10 percent include diverse private entities, associations and consortia.

The general objectives of the EOSC Partnership are set out in the Partnership’s MoU: i) ensure that Open Science practices and skills are rewarded and taught, becoming the ‘new normal’; ii) enable the definition of standards, and the development of tools and services, to allow researchers to find, access, reuse and combine results; iii) establish a sustainable and federated infrastructure enabling open sharing of scientific results.

The EC and the EOSC-A envisaged to dedicate up to EUR 990 million to actions within the scope of the Partnership for the period 2021-2030, consisting of up to EUR 490 million by the EC through Horizon Europe actions and up to EUR 500 million by the EOSC-A members through in-kind contributions.

Main achievements and challenges

The EOSC Partnership has achieved an impressive mobilisation of resources at European and institutional level towards the delivery of its objectives. Over 2022 only, the members of the EOSC-A reported EUR 292 million in in-kind activities contributing to the objectives of the Partnership, while the total amount of reported and planned contributions by the EOSC-A members during the period 2022-2024 amounts to almost one billion euro. This amount is almost double to the amount that the EOSC-A envisaged to contribute during the whole duration of the EOSC Partnership, i.e. up to 2030. This significant contribution signals the strong relevance of the objectives of the EOSC Partnership for the EOSC-A members and the European scientific community at large.

The EOSC Partnership has also contributed towards the development of Horizon Europe calls to support the EOSC objectives, with increased community involvement compared to the process used in Horizon 2020. As detailed below, input to EOSC call definition was based in the reported period on a broad consultation process coordinated by the EOSC A that fed into the identification of priorities to be included in the revision of the Multi-Annual Roadmaps (MAR) of the EOSC Strategic Research and Innovation Agenda (SRIA).

The EOSC-A Task Forces, bringing together around 400 volunteers from the broader research community, have been instrumental in developing community consensus around key thematic areas and concepts related to the Partnership’s objectives. During 2023, the EOSC-A has also supported technical discussions around the development of the EOSC Federation, including by organising workshops with its members, in particular the Mandated Organisations and ESFRI research infrastructures on the concept of the EOSC ‘nodes’.

The Partnership has also achieved a remarkable track record of activities aimed to raise awareness about EOSC at national level and support the structuring of national EOSC communities within the EU member states and countries associated to Horizon Europe. This was typically achieved through support by the EOSC-A and the EC to the organisation of EOSC National Tripartite Events in 28 countries. A total of more than 2.800 participants have been reached in 2022 and 2023 alone.

Moreover, the Partnership has supported the cooperation and concertation of EOSC-related EU-funded projects contributing to the EOSC Strategic R&I Agenda, as well as the broader EOSC community, through an EOSC Stakeholders Forum. The EOSC-A has developed a common branding for EOSC initiatives¹ and a *vademecum*² for EOSC-related stakeholders and projects.

The EOSC-A initiated in 2022 a discussion on the governance and sustainability of EOSC after 2027. EOSC-A invited the EC, as well as the EU Member States and the countries associated to Horizon Europe, through the EOSC-SB, for this. By the middle of 2023 several webinars on different legal modalities have been organised involving the three parties and various proposals for future governance are being discussed.

Several challenges have been identified during these first two years of the EOSC Partnership. Given that the EOSC-A was established only in 2020, it has been a challenge during the beginning of the Partnership for this new organisation to quickly build up the necessary capacity and resources.

One of these challenges has been the effective coordination and alignment of effort of an increasingly large and diverse EOSC community that includes (i) more than 250 members of the EOSC-A, (ii) more than 330 organisations participating in INFRAEOSC projects and (iii) more than 40 European countries and regions involved as EOSC participating states. A Tripartite EOSC collaboration has been put in place to ensure a level of strategic collaboration and alignment among the EC, the EOSC-A and the participating countries. Targeted coordination activities and support actions have also been carried out by the EC and the EOSC-A with the INFRAEOSC project consortia. Despite these initiatives, there is a need to further support the alignment and sustainability of the Partnership outcomes, including results of the EOSC EU-funded grants.

The EOSC Partnership is also seeking to reduce to the extent possible any 'survey fatigue' of EOSC-A members and other EOSC-related stakeholders. A significant amount of resources of the EOSC-A is devoted in following up the reporting requirements related to the Partnership. While some measures have been implemented to facilitate and streamline monitoring and reporting activities, the Partnership will continue to explore the space for further improvement in the coming years.

Main activities

Directionality: Strategic Research and Innovation Agenda, Multiannual Roadmaps, projects

The EOSC precursor governance (2019-2020) established the SRIA 1.0, which included the Multi-Annual Roadmap (MAR) for 2021-2022. The EOSC-A coordinated the process to develop the MARs for 2023-2024 and 2025-2027, which were incorporated in revised versions of the SRIA (SRIA 1.1 and 1.2) approved by the EOSC Partnership Board. All MARs are based on extensive community input received from the EOSC-A Task Forces, the members of the EOSC-A and the research community at large. The MARs informed the development of the call topics

¹ [https://eosc.eu/sites/default/files/2023-04/Co-Branding Guidelines for HE INFRAEOSC Projects.pdf](https://eosc.eu/sites/default/files/2023-04/Co-Branding_Guidelines_for_HE_INFRAEOSC_Projects.pdf)

² [https://eosc.eu/sites/default/files/2022-10/Vademecum HE EOSC-related Projects.pdf](https://eosc.eu/sites/default/files/2022-10/Vademecum_HE_EOSC-related_Projects.pdf)

of the INFRAEOSC Destination in the Horizon Europe work programme for research infrastructures.

The Horizon Europe ‘EOSC Focus’ project, coordinated by EOSC-A, aims to support the development of an effective and thriving EOSC ecosystem to ensure the achievement of the EOSC Partnership objectives. Among its various coordination and support activities, EOSC Focus developed the ‘EOSC implementation Macro-Roadmap’³, a web-based visualisation tool of selected results of EOSC-related projects and activities by the Partners, grouped according to selected SRIA objectives and action areas. The Macro-Roadmap currently displays results from EOSC EU-funded projects and in the future, it will also display selected in-kind contributions of the EOSC-A members. Moreover, guidelines have been laid out by the EOSC-A⁴ that aim to assist EOSC-related EU-funded projects to better coordinate their activities in the context of the Partnership. Based on these guidelines, EOSC Focus established three working groups (‘Technology’, ‘Communication and Engagement’, and ‘Impact’) across INFRAEOSC projects to enable them to actively engage, collaborate and coordinate between one another and with the broader community of contributors to the Partnership. In the context of the partnership, the EC, with support by the EOSC-A, organised two coordination meetings of EOSC-related EU-funded projects, in September 2022 and in June 2023. Both events aimed to promote coordination between the projects, as well as among the projects, the EC and the EOSC-A. Following a suggestion at the 2023 meeting, which identified a significant collaboration gap among the HE projects, the EOSC-A, supported by EOSC Focus, started planning the EOSC Winter School to address these gaps and deepen technical understanding in various opportunity areas, with the main goal to enhance collaboration and integration among HE projects.

Tripartite collaboration

The EC, the EOSC-A, and the EU member states and countries associated to Horizon Europe and represented in the EOSC Steering Board⁵ come together as the EOSC Tripartite collaboration that aims to coordinate and align European, national and institutional contributions along the common objectives of the EOSC partnership.

European EOSC Tripartite Events have taken place in December 2021, November 2022 and May 2023, setting out strategic priorities for the short and medium term and discussing the long-term future of EOSC after 2027.

Since 2022, EOSC-A drove the process to organise a series of National Tripartite Events (NTEs) on EOSC, bringing together representatives from the EC, the EOSC Steering Board, the country’s relevant ministries and/or funding organisations and the country’s community active in open science, often including EOSC-A members that are mandated organisations⁶. The first NTE took place in May 2022 and have since then included 28 countries, reaching 2,289 participants, and engaging 342 speakers or panellists across Europe⁷.

European Data Spaces

The European Strategy for Data⁸ recognises EOSC is “*the basis for a science, research and innovation data space that will bring together data resulting from research and deployment*”

³ <https://eosc.eu/roadmap/>

⁴ Vademecum - A Handbook for Effective Collaboration within the EOSC co-programmed Partnership
[https://eosc.eu/sites/default/files/2022-10/Vademecum HE EOSC-related Projects.pdf](https://eosc.eu/sites/default/files/2022-10/Vademecum%20HE%20EOSC-related%20Projects.pdf)

⁵ The EOSC Steering Board is an EC expert group - <https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3756>.

⁶ Mandated Organisations are Members of EOSC-A appointed by their respective ministries to serve as bi-directional operators between their national-level interests and EOSC-A.

⁷ See the ‘country pages’ in eosc.eu for further info and documentation.

⁸ EC COM/2020/66

programmes and will be connected and fully articulated with the sectoral data spaces". In 2023, the EOSC Partnership established a systematic collaboration with the Data Spaces Support Centre (DSSC), which is elaborated in section 4.3 below. Several EU-funded EOSC projects working on FAIR implementation have been linking with the DSSC to mainstream the FAIR experience accumulated by research organisations in Europe.

Monitoring of progress of the EOSC Partnership

The EOSC Partnership's Monitoring and Evaluation Framework (MF), adopted in April 2022, addresses the General, Specific and Operational Objectives of the Partnership as stated in the MoU.

1.2 Impact case studies

GALAXY DISTRIBUTED INFRASTRUCTURE
Type of Result: Infrastructure
GALAXY is a distributed computing network across 13 European countries, accessible via six national, user-friendly web portals, facilitating access to computing and storage infrastructures across Europe, as well as to data, tools, workflows, and user-customisable services. Workflows are designed to integrate with EOSC-Core. Adoption, development, and implementation of technologies to interoperate across services will allow researchers to produce high-quality FAIR data, open to all EOSC users. Communities across disciplines -- Life Sciences, Climate and Biodiversity, Astrophysics, Materials science -- will demonstrate the bridge from EOSC's technical services to scientific analysis.
Problem Addressed Addressing the lack of data computation and storage capacity with the development of public nodes that can be used by a large number of users, including from countries that lack the resources to run their own Galaxy server, so that their computational jobs (including Virtual Research Environments) can be executed on national resource providers. Also accounts for environmental footprint Development of a scheduler that takes into account proximity to the data source, energy efficiency and environmental overhead when scheduling the job distribution over the European servers.
Link1: https://galaxyproject.org/projects/esg/ Link2: https://usegalaxy.eu
Funding: EuroScienceGateway is funded by Horizon Europe (HORIZON-INFRA-2021-EOSC-01-04) under grant agreement number 101057388 and by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10038963. usegalaxy.eu is supported by the German Federal Ministry of Education and Research grant 031L0101C and de.NBI-epi.

European COVID-19 Data Platform
Type of Result: Infrastructure and Service
The European COVID-19 Data Platform enables the rapid collection and comprehensive data sharing of available research data from different sources for the European and global research communities, in order to accelerate research on coronavirus. It is a high-priority pilot to realise the objectives of the European Open Science Cloud (EOSC). It consists of three connected components: SARS-CoV-2 Data Hubs , which organise the flow of SARS-CoV-2 outbreak sequence data and provide comprehensive open data sharing for the European and global research communities; Federated European Genome-phenome Archive , which provides secure controlled access sharing of sensitive patient and research

subject data sets relating to COVID-19; **COVID-19 Data Portal**, which brings together and continuously update relevant COVID-19 datasets and tools, will host sequence data sharing and will facilitate access to other SARS-CoV-2 resources.

Problem Addressed: Response to the COVID-19 pandemic requires a rapid and open sharing of data to accelerate research and discovery. Provision of comprehensive open data (on infectious agents and related diseases during outbreaks) supports evidence-based decision-making across scientific, medical, public health and policy domains and promotes reproducibility of research outcomes. Providers and repositories can be found and (if possible) accessed, while considering the challenge of dealing with sensitive data. The Portal is forming part of the pandemic preparedness toolkit to address future pathogen outbreaks.

Link1: <https://www.covid19dataportal.org/the-european-covid-19-data-platform>

Funding: BY-COVID is funded by Horizon Europe (HORIZON-INFRA-2021-EMERGENCY-01) under grant agreement number 101046203.

Data Steward (University of Bologna, IT)

Type of Result: Skills

The University of Bologna (UniBo) is one of the first Italian Universities investing in the creation of a Data Stewardship Team, exclusively focused on multidisciplinary research data and their management. It works in close collaboration with legal and knowledge transfer officers. In a fragmented national landscape, UniBo aims at setting an example of how research data support services can be structured and at facilitating the creation of a national data stewardship network. Inspired by UniBo's participation in the EOSC Task Force on Data stewardship, curriculum and career paths, this initiative is part of the wider digital transformation of the University of Bologna, underpinned by research data management and Open Science practices.

Problem addressed: Overcome fragmentation of support services for research data management towards Open Science at the institutional/national level. Establish a common OS vocabulary across disciplines and research teams.

Funding: in-kind additional activities from partners other than the Union (AAP category 5 - Skills and Training): University of Bologna

Link: <https://www.unibo.it/en/research/open-science/open-science>

Sustainability of the SSH Open Marketplace after the end of the SSHOC project

Type of Result: Infrastructure

Together with CLARIN and CESSDA, DARIAH sustained an important outcome of the SSHOC project after its completion: The SSH Open Marketplace. It is a discovery portal which pools and contextualises resources for Social Sciences and Humanities research communities: tools, services, training materials, datasets, publications and workflows. The Marketplace highlights and showcases solutions and research practices for every step of the SSH research data life cycle.

The SSH Open Marketplace is: a discovery portal, to foster serendipity in digital methods; an aggregator of useful and well curated resources; a catalogue, contextualising resources; and: an entry point in the EOSC for the Social Sciences and Humanities researchers. The SSH Open Marketplace can indeed be found as a service on the EOSC Marketplace resources.

Problem addressed: providing an entry point in EOSC for the Social Sciences and Humanities researchers.

Funding: in-kind additional activities from partners other than the Union (AAP category 1 - Upgrading of existing research infrastructure): DARIAH ERIC

Link: bit.ly/47ufO4l

2. Contributions by the Partners (additionality)

2.1 Implementation of the HE Work Programme during the reporting period (Union contribution)

The INFRAEOSC Destination of the Horizon Europe work programme for research infrastructures accounted for the projected EUR 490 million investment by the EC into the EOSC Partnership. In this reporting period, nineteen project proposals were awarded through the 2021 and 2022 calls for funding, for a total EU contribution of EUR 104 million, including EOSC-related projects from INFRA-DEV, INFRA-EMERGENCY and WIDERA parts of the HE work programme, as detailed in Table 1.

INFRAEOSC 2021 and 2022 calls included 10 topics for funding whose scope and expected outcomes were well aligned with the strategic objectives set out in the EOSC Partnership's Strategic R&I Agenda. These include the support for a digitally skilled workforce, the development of core components and services for EOSC, including those that underpin the reform of research assessment, enabling discovery and interoperability of federated FAIR research objects across scientific communities, support to the activities of the EOSC Partnership and of international initiatives aimed at alignment and setting standards for FAIR data. Notably 2021-22 calls also provided dedicated support to EU missions in HE on Cancer and on Oceans.

Out the 19 funded projects, 12 are Research and Innovation Actions (RIA), and the remaining 7 are Coordination and Support Actions (CSA). All 19 projects kicked-off within the expected dates. The 19 project consortia include 282 unique participants from 32 countries: 22 EU Member States, 3 countries associated to Horizon Europe and other 7 non-EU countries. Widening countries contribute with 84 participations in these projects, and received a total EU contribution of EUR 19 million, which is 18% of the total.

The six topics covered by the INFRAEOSC 2023 calls were opened for submission during the first half of 2023. The evaluation of proposals and the signature of grant agreements with selected

projects were concluded during the second half of 2023, which lies outside the reporting period covered in this document.

In order to ensure that the Commission's policy-making process is enriched with evidence from the projects funded under these programmes, a structured mechanism for feedback to policy has been agreed to be put in place. It includes policy briefs as mandatory deliverable for projects resulting from calls from 2022 onwards, among other activities.

2.2 Contributions by the Partners other than the Union (direct leverage)

Following Article 1.3 of the Statutes of EOSC-A, the Partners other than the Union (EOSC-A Members) agreed to engage in a European Partnership with the European Commission to promote, facilitate and carry out innovation, dissemination and other activities aiming at achieving the specific and operational objectives as defined in the EOSC Strategic and Innovation Agenda (SRIA) and the Memorandum of Understanding (MoU). According to the MoU, EOSC-A Members have committed to deliver a volume of additional activities totalling to €500M over the duration of the EOSC Partnership (until the end of 2030). These in-kind Additional Activities are contributions towards the specific and operational objectives defined in SRIA and the MoU that are not covered by European Union funding (except for EC Structural Funds and funding from the Recovery and Resilience Facility).

In October 2023, a final survey was launched to gather information on actual contributions in 2022 with an overall amount reported of 292 Mill EUR (vs 312 Mill EUR planned in-kind contributions). Thus, over half of the committed volume of activities in the MoU was already achieved by the end of 2022. As shown in Table 2, the deviation between planned and actual amounts was mostly due to the following factors: lower/higher number of FTEs participating in an activity than originally planned; use of an FTE monetary conversion more in line with their country staff costs; prorated amounts amongst different financial years and change of activities.

There are great success stories linked to the work done by EOSC-A Members in the AAP2022 report. Just over EUR 116 million were invested in upgrading national and existing e-infrastructures; investments in these activities included funding upgrades of data infrastructures and research infrastructures with well-established processes for research data management practices. For example, EUR 0.6 million were spent in building a broader understanding of the international PID landscape and creating broader awareness of the current and future possibilities of PID applications to ensure that information about research is more Findable, Accessible, Interoperable and Reusable⁹.

The health system is one of the main beneficiaries from the contributions of EOSC-A Members to the EOSC ecosystem through the work done in various areas, as shown in a few examples below:

⁹ Coöperatie SURF u.a. Report "From ORCID Pilot to a PID-centric framework for Research Information" <https://zenodo.org/records/5836056>

- The establishment of a Real-World Data repository for Medical Imaging represents a significant stride in building a biobank focused on medical imaging data. This initiative aims to openly provide data while carefully navigating ethical and legal considerations. Additionally, this effort capitalises on services available through the EOSC marketplace, with a financial backing of 300,000EUR from the Universidad Politécnica de Valencia.
- The Université de Montpellier invested 3 Mill EUR in the development of new platforms dedicated to Health Data. These platforms will offer a range of services and infrastructures designed for effective data management and high-performance computing. This includes replicated massive data storage, cloud infrastructures, computing resources, and visualisation nodes, including those with substantial memory capacity. This significant investment underscores the commitment to advancing capabilities in health-related data initiatives.
- Provision of technical and personnel capacities for processing SARS-CoV-2 sequences in Slovakia - This involves the uploading of data, conforming to the necessary standards, to key repositories such as GISAID and the European Nucleotide Archive (ENA), as well as the covid19dataportal.org. The process involves receiving raw data from laboratories, which is then meticulously processed into the requisite format. Additionally, if needed, the systems have the capability to generate exports and various visualisations, adding a layer of versatility to the overall data processing and presentation.

Equally important is the work done through Additional Activities aiming at turning innovation into business opportunity. The University Politecnico di Torino, and its Incubator I3P, plays a crucial role in supporting the establishment and growth of innovative start-ups with high technological intensity. This initiative, founded by both the university and external entrepreneurs, provides coaching, mentoring, fundraising support, spaces, and strategic and consulting services. In addition, I3P organises annual events such as the NASA Space Apps Challenge- a hackathon aimed at generating open-source solutions for real-world challenges on Earth and in space. The theme for 2023 is "Explore Open Science Together," reflecting a commitment to the cooperative accessibility of scientific knowledge. I3P's outstanding contributions was recognised globally, earning it the title of the Best Public Business Incubator according to the World Rankings of Business Incubators and Accelerators in 2019-2020.

The EOSC A members have also engaged in activities that focus on advancing and consolidating the Research and Innovation (R&I) ecosystem within the partnership's region. These initiatives aim to foster knowledge exchange, supporting data-intensive science and interdisciplinary research. Notably, the Flemish Open Science Board and the Flemish Research Data Network have collaboratively established a network dedicated to formulating a cohesive Open Science policy for Flemish universities and research institutions.

We are looking forward to reporting on further success stories achieved by EOSC-A Members. In the third Quarter of 2022 a survey was run to gather estimated contributions of EOSC-A Members in 2023 resulting in 383 MEUR. Moving forward, a survey will be run in the second quarter of 2024 to collect actual contributions in 2023. While the collection of the estimated additional activities for 2024 is currently taking place.

No in-kind contributions from the Partners other than the Union (EOSC-A Members) were reported in the HORIZON INFRA projects as detailed in Table 1.

Table 1: Contributions provided by the Partners other than the Union and by the EU to the Partnership's Horizon Europe projects in the reporting period (01/06/2021-30/06/2023)

Call for proposals code	Link to Partnership's general objective(s)	In-kind Contributions ¹⁰ paid by constituent or affiliated entities ¹¹ in Partnership's Horizon Europe projects to which they contribute (M€)	Contributions/funding paid by the EU to <u>all</u> the Partnership's Horizon Europe projects ¹² under that call for proposals (M€)
HORIZON-INFRA-2021-DEV-01	GO3	0 €	2.802.182,50 €
HORIZON-INFRA-2021-EMERGENCY-01	GO2	0 €	12.000.000,00 €
HORIZON-INFRA-2021-EOSC-01	GO1; GO2; GO3	0 €	59.811.815,00 €
HORIZON-INFRA-2022-EOSC-01	GO1; GO2; GO3	0 €	27.210.023,50 €
HORIZON-INFRA-2023-EOSC-REP-ART195-IBA	GO2	0 €	429.536,25 €
HORIZON-WIDERA-2021-ERA-01	GO2	0 €	1.883.841,25 €

Table 2: In-kind Contributions provided by Partners other than the European Union in the form of Additional Activities (01/06/2021-31/12/2022) - see annex for full table

AAP Category	Planned amount	Actual amount	Explanation of any major deviations from the AA Plan
1. Support to additional R&I	132.165.265,20 €	148.478.941,00 €	- Discrepancies in the number of FTEs - Different FTE conversion used - New Activity/es not previously reported - Activity cancelled postponed due to funding
2. Scale up of technologies	2.876.736,00 €	11.625.605,00 €	- Discrepancies in the number of FTEs - Different FTE conversion used - New Activity/es not previously reported
3. Demonstrators	63.932.416,42 €	21.540.346,00 €	- Activity planned investment 60MillEUR reduced to 13 Mill EUR (amount has been prorated between different financial years)

¹⁰ These consist of eligible costs in accordance with the Horizon Europe rules minus the Union contribution.

¹¹ See definition of affiliated entities in footnote 9 of the Memorandum of Understanding.

¹² i.e. **both** to constituent or affiliated entities of the Partners other than the Union AND to entities not affiliated to the Partners other than the Union.

4. Creating new business opportunities	769.350,00 €	646.350,00 €	- Discrepancies in the number of FTEs - Different FTE conversion used
5. Training & Skills development	25.893.368,69 €	26.343.700,00 €	
6. Contribution to the development of new standards, regulations and policies	30.608.601,00 €	28.011.358,00 €	- Discrepancies in the number of FTEs - Different FTE conversion used - New Activity/es not previously reported
7. Supporting ecosystem development	33.859.813,00 €	33.473.995,00 €	- Discrepancies in the number of FTEs - Different FTE conversion used - New Activity/es not previously reported
8. Communication, dissemination, awareness raising, citizen engagement	5.510.900,00 €	6.474.084,40 €	- Discrepancies in the number of FTEs - Different FTE conversion used - New Activity/es not previously reported
9. Other	16.837.247,00 €	15.568.582,94 €	- Discrepancies in the number of FTEs - Different FTE conversion used - New Activity/es not previously reported
Total Contributions	312.453.697,31 €	292.162.961,94 €	

2.3 Investments in operational activities by the Partners other than the Union (indirect leverage)

EOSC-A Members have already contributed to achieving the EOSC Partnership’s objectives beyond their committed in-kind contributions. In addition to these contributions, further public and private investments have taken place to value, exploit and support results triggered by the Partnership. A few examples of investments in operational activities that go beyond the work foreseen in the SRIA are shown in table 3 (see ANNEX 3).

EOSC is a new Partnership and EOSC-A a newly established organisation, and in the first few years of its creation the focus has been placed on establishing a sound and transparent process for collecting EOSC-A members' in-kind contributions. This is shown through the results gathered in the AAR 2022 survey as well as the plans for 2023 and 2024, where it is shown impressively that “the partners other than the Union” are extraordinarily performing and highly committed to the goals and objectives of the Partnership. Should the 2022 trend continue for 2023, the EOSC-A will have already achieved our 10-years- commitment after just 2 years. Going forward with AAP 2025, we will consider exploring the indirect leverage of the in-kind contributions more systematically.

3. Progress towards the objectives (directionality)

3.1 Progress toward the Horizon Europe Key Impact Pathways (KIPs)

In line with the EOSC partnership Monitoring Framework¹³, the most relevant KIPs for the EOSC Partnership are:

1 - Creating high-quality new knowledge: this indicator is at the heart of the EOSC initiative, which will create a trusted, virtual, federated environment in Europe to store, share and reuse high-quality digital outputs from research (including publications, data, metadata, and software) across borders and scientific disciplines, for excellent science.

2 - Strengthening human capital in R&I: Open Science and FAIR data management practices are essential to allow contributing towards the EOSC resources. This requires the training of human resources to learn and adopt the novel practices. Incentives for the upskilling of the human capital (researchers, data stewards, librarians, administrators, and managers) and support measures to facilitate this transition are required. A number of HE projects are expected to deliver on this indicator (e.g. Skills4EOSC).

3 - Fostering diffusion of knowledge and open science: The EOSC Partnership, as a flagship open science initiative, mainly contributes towards this Key Impact Pathway indicator. Activities in Horizon Europe to support this objective mainly include the projects funded under the INFRAEOSC Destination. Moreover, there are more than 220 topics across the Horizon Europe Work Programmes that have been flagged as particularly relevant for EOSC and FAIR data.

4 - Addressing Union policy priorities and global challenges through R&I: The realisation of EOSC is a top priority of the European Research Area and at the heart of the European digitalisation strategy¹⁴. EOSC-related projects have also contributed to other EU priorities, for example the BY-COVID project has produced the European COVID-19 Data Platform, supporting the fight against the COVID-19 pandemic, and strengthening the overall European pandemic preparedness.

5 - Delivering benefits and impact through R&I missions: The EOSC Partnership cuts across thematic areas and thus also contributes to the delivery of the EU R&I Missions. Moreover, dedicated INFRAEOSC projects have been awarded in the Missions-related areas on cancer, oceans and waters, and adaptation to climate change.

Table 4: Horizon Europe Key Impact Pathways (KIPs)¹⁵

Key Impact Pathway¹⁶	Short-term	Medium-term	Longer-term	Result per action or globally at the end of the reporting period¹⁷
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¹³ <https://eosc.eu/sites/default/files/2022-05/Monitoring%20Framework.pdf>

¹⁴ ERA policy agenda – ERA Action 1 - https://research-and-innovation.ec.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

¹⁵ These Key Impact Pathways were defined in the Horizon Europe Regulation. All instruments receiving funding from Horizon Europe, including all European Partnerships, need to report on them.

¹⁶ For some of those KIPs, the data will not be available in the short or even the medium term. For the first reporting period, most probably the focus will be on short-term impact.

¹⁷ We would suggest here to do the reporting not per action but globally at the end of the reporting period; to be confirmed after discussions with the colleagues responsible for the KIPs.

Towards scientific impact				
1 - Creating high-quality new knowledge	Publications -Number of peer-reviewed scientific publications resulting from the Programme	Citations -Field-Weighted Citation Index of peer-reviewed Publications resulting from the Programme	World-class science - Number and share of peer-reviewed publications resulting from the projects funded by the Programme that are core contribution to scientific fields	N/A (As the only indicator for scientific quality, this is not in line with the Open Science development and with the COARA approach from the European Commission. This should be rephrased as “number of ‘peer-reviewed’ publications in ‘Open Access’”).
2 - Strengthening human capital in R&I	Skills -Number of researchers involved in upskilling (training, mentoring/coaching, mobility and access to R&I infrastructures) activities in projects funded by the Programme	Careers -Number and share of upskilled researchers involved in the Programme with increased individual impact in their R&I field	Working conditions - Number and share of upskilled researchers involved in the Programme with improved working conditions, including researchers' salaries	Too early to assess
3 - Fostering diffusion of knowledge and open science	Shared knowledge Share of research outputs (open data/publication/software etc.) resulting from the Programme shared through open knowledge infrastructures	Knowledge diffusion -Share of open access research outputs resulting from the Programme actively used/cited	New collaborations -Share of Programme beneficiaries which have developed new transdisciplinary/transsectoral collaborations with users of their open access research outputs resulting from the Programme	- 13 INFRAEOSC Projects awarded - 6 EOSC-related projects awarded from other parts of the HE Work Programme
Towards societal impact				
4 - Addressing Union policy priorities and global challenges through R&I	Results -Number and share of results aimed at addressing identified Union policy priorities and global challenges (including SDGs) (multidimensional: for each identified priority) Including: Number and share of climate-relevant results aimed at delivering on the Union's commitment under the Paris Agreement	Solutions -Number and share of innovations and research outcomes addressing identified Union policy priorities and global challenges (including SDGs) (multidimensional: for each identified priority) Including: Number and share of climate-relevant innovations and research outcomes delivering on Union's commitment	Benefits -Aggregated estimated effects from use/exploitation of results funded by the Programme on tackling identified Union policy priorities and global challenges (including SDGs), including contribution to the policy and law-making cycle (such as norms and standards) (multidimensional: for each identified priority) Including: Aggregated estimated effects from use/exploitation of climate-relevant results funded by the Programme on	Most relevant EU priority is digitalisation. All results from the INFRAEOSC projects and other EOSC-related projects can be counted as delivering towards this indicator for this priority, transversally impacting all the SDGs and all EU priorities.

		under the Paris Agreement	delivering on the Union's commitment under the Paris Agreement including contribution to the policy and law-making cycle (such as norms and standards)	
5 - Delivering benefits and impact through R&I missions	R&I mission results - Results in specific R&I missions (multidimensional: for each identified mission)	R&I mission outcomes in specific R&I missions (multidimensional: for each identified mission)	R&I mission targets met - Targets achieved in specific R&I missions (multidimensional: for each identified mission)	3 Mission-related INFRAEOSC projects awarded (EOSC4Cancer; Blue-Cloud 2026; AquaINFRA)
6 - Strengthening the uptake of R&I in society	Co-creation -Number and share of projects funded by the Programme where Union citizens and end-users contribute to the co-creation of R&I content	Engagement - Number and share of participating legal entities which have citizen and end-user engagement mechanisms in place after the end of projects funded by the Programme	Societal R&I uptake - Uptake and outreach of co-created scientific results and innovative solutions generated under the Programme	Too early to assess
Towards technological / economic impact				
7 - Generating innovation-based growth	Innovative results -Number of innovative products, processes or methods resulting from the Programme (by type of innovation) & Intellectual Property Rights (IPR) applications	Innovations - Number of innovations resulting from the projects funded by the Programme (by type of innovation) including from awarded IPRs	Economic growth -Creation, growth & market shares of companies having developed innovations in the Programme	Too early to assess
8 - Creating more and better jobs	Supported employment - Number of full time equivalent (FTE) jobs created, and jobs maintained in participating legal entities for the project funded by the Programme (by type of job)	Sustained employment - Increase of FTE jobs in participating legal entities following the project funded by the Programme (by type of job)	Total employment -Number of direct & indirect jobs created or maintained due to diffusion of results from the Programme (by type of job)	Too early to assess
9 - Leveraging investments in R&I	Co-investment -Amount of public & private investment mobilised with the initial investment from the Programme	Scaling-up -Amount of public & private investment mobilised to exploit or scale-up results from the Programme (including foreign direct investments)	Contribution to '3 % target' - Union progress towards 3 % GDP target due to the Programme	Too early to assess

3.2 Progress achieved on the Partnership-specific KPIs

The EOSC Partnership’s MoU articulates 3 general, 9 specific and 14 operational objectives. Progress against these objectives is monitored through the KPIs described in the Monitoring Framework (MF) of the EOSC Partnership¹⁸. The KPIs refer to target values to be achieved by certain timeframes (2023, 2025, or 2027).

Table 5 shows baselines, current results and future target for selected KPI indicators reflecting the chosen indicators for the BMR2024 - Partnership Fiche. The information collected returns the picture of a resourceful environment, with institutional policies on data sharing and reuse, either aligned with EU priorities or progressing in this direction. As an outcome, the partners demonstrate an advanced ‘EOSC-readiness’ in terms of documented standards and protocols for data sharing and reuse and progressing rapidly towards an immediate open access to publications. On the other hand, during the reporting period there have been no operational MVE core functions implemented (the EOSC EU node is planned to become operational in 2024) and the interoperability framework is still fragmented. The desired impact is starting to materialise in terms of making open science the new norm, with Research Infrastructures acting as champions and countries starting to insert the Open Science dimension in their educational curriculum offer. The fuller impact of the EOSC initiative can only materialise once the EOSC EU Node is operational and with a federation of service providers and users benefiting from it.

Table 5: Partnership-specific KPIs (as defined in the SRIA) - In this table, the “results at the end of the reporting period” coincide to the baseline values surveyed, in October 2022, and refer to the year 2021. A colour code was applied: green for KPIs achieved; orange for KPIs on track; red for underachieving KPIs.

KPI name	Measurement Unit	Baseline / results at the end of the reporting period	Target 2027 (or 2030)
Resources (input), processes and activities			
The EOSC EU Node is operational and a growing number of EOSC core functions are discoverable	# of EOSC core functions that are discoverable through the EOSC EU Node	0	4
Metadata are increasingly available for public research data sets	% of EOSC-A RFOs that require (meta)data sharing and incentivise data re-use	67% data sharing, 50% data re-use	70%
Members’ policies adopt Open Science principles and encourage Open Science best practises	% of EOSC-A members that request FAIR in project design via data management plans	40%	70%
Outcomes			
The EOSC Interoperability Framework is adopted by major EU RI (SO5_01)	# of RIs adopting the EOSC Interoperability Framework	0 ¹⁹	5

¹⁸ <https://eosc.eu/sites/default/files/2022-05/Monitoring%20Framework.pdf>

¹⁹ See EOSC-A TFs’ contributions: i) <https://zenodo.org/records/8109528>; ii) <https://zenodo.org/records/8399710>

The publications from EOSC-A members are immediately available in open access (SO1_01)	% of open access publication-record, per year	49%	70%
Thematic European research infrastructures have documented standards and protocols for data sharing and re-use (SO4_02)	% of major RIs with documented standards and protocols	83%	60%
Impacts			
Open Science is the new norm: i) A growing number of major Research Infrastructures (as a proxy for all major scientific disciplines) have relevant data and services indexed through EOSC ii) A growing number of national education systems recognise curricula for data stewards	N of scientific disciplines (Frascati Nomenclature-Level 1), in major Research Infrastructures, that have relevant data and services indexed through EOSC.	5 from the 6 major disciplines	All major scientific disciplines have relevant data and services indexed through EOSC
	Number of countries where educational curricula with an Open Science dimension were offered	6 (CZ, GE, NL, IE, SK, HR)	5

3.3 Progress achieved on KPIs common to all Partnerships

1. In terms of additionality, the EOSC Partnership has delivered more than half of the expected in-kind contribution by the partners, in just one year (2022). Considering the Partnership's Additional Activities Plan for 2023 and 2024, the target volume of EUR 500 million will very likely be surpassed well before the expected end of the Partnership (2030).
2. The traction generated by the Partnership is evident in the EOSC National Tripartite events and the EU-funded projects' working groups, where also non-members of EOSC-A can join. Given the success in frequency/attendance to both types of events, the progress is tangible towards the creation of a highly synergistic environment, in aspects as varied as technology, impact, communication, coordination and governance.
3. The EOSC Partnership delivers mainly on the EU Digitalisation priority, which transversally impacts on the other EU priorities, with an enabler effect. With this logic, the whole of the investment of the Partnership can be accounted towards the Digitalisation priority. At the time of the report, 65% of the total Partnership budget has been committed.
4. Openness and transparency are continuously pursued with dedicated activities, including organisation of bi-annual General Assembly meetings, community consultations on the Multiannual Roadmaps, establishment of physical and virtual exchange platforms, such as, respectively, the EOSC Task Forces and the EOSC Forum, the EOSC National Tripartite Events, the EOSC Symposium, and the use of web-based social communication media.
5. Openness is demonstrated by a membership base enlarging by nearly 40% (n= +71) with respect to the baseline value (N=185) recorded at the time of incorporation (July 2021); The newcomers are from 27 EU countries, 11 Associated countries, 20 widening countries and 4 third countries; they represent RPOs (61%), SPs (17%) and RFOs (3%), while the rest of the newcomers (19%) serve more than one role.
6. More than one quarter of the newcomers, (27%; N=19) are involved in EOSC-related HE projects. These are 11 RPOs, 5 SPs and 3 entities with a mixed scope; they are from 12 EU MSs (of which 3 Widening Countries), and two non-EU countries (CH, UK).
7. In terms of coherence and synergies, coordinated and joint activities are established and will expand with other Partnerships (eg Innovative Health Initiative, ERA for Health, High

- Performance Computing, Metrology and AI-Data-Robotics), as well as with EU Missions such as the ones on Adaptation to Climate change, Cancer, and Restore our Ocean and Water.
8. Several members of the EOSC-A use national, regional, or EU funds to finance their additional activities. In the future, the monitoring of the Additional Activities by the Partners other than the Union will endeavour to systematically resolve the volume of these resources and the funding streams.
 9. The EOSC Partnership is striving to reach out to various national, European and international for a related to EOSC and open science. The organisation of National Tripartite events is very successful: between January 2022 - June 2023, the NTEs targeted 25 countries, with 2176 total participants, and engaging 343 speakers, moderators and panellists. The EOSC.eu website has an average of 8320 views a month, four-times above its target of 2000 views/month. Followers on social media are steadily growing (c.a +10% per month).
 10. The alignment of policies and strategies is being achieved through the tripartite collaboration framework between EC, EOSC-A and EOSC Steering Board, as well as with the establishment of country-based EOSC-A Mandated Organisations, the EOSC Tripartite Events and EOSC National Tripartite Events.

4. Functioning of the Partnership

4.1 Governance

The EOSC Partnership Board is the structure responsible for taking decisions for the EOSC Partnership. It is the main mechanism for dialogue and steering to reach the objectives set out in the MoU. The functioning of the Partnership Board is set out in the Rules of Procedure agreed by the EOSC Partnership Board.

The EOSC-A nominates its Members to the Board selected among the EOSC-A or its constituent entities. The EC is represented by two members, i.e. the relevant Directors in DG RTD and DG CNECT or their deputies or substitutes. The EOSC Steering Board may nominate up to two representatives to participate as observers at the EOSC Partnership Board meetings.

During the last two years many operative aspects of the Partnership have improved, also thanks to the strengthening of the EOSC-A Secretariat and the support provided by EOSC Focus: i) a solid mechanism has been established for the development of the INFRAEOSC calls for funding on the basis of the EOSC community's input; ii) the monitoring and evaluation of the Partnership has been regularly achieved, despite a recognised burden on the Partnership budget (2 FTEs employed by EOSC-A and 2 FTEs provided via EOSC Focus) as well as on the EOSC-A members; iii) reinforced support to the EOSC-A members and the broader scientific communities.

With 250 members and observers, the EOSC-A brings a real potential to grasp expertise and current developments on national and institutional levels, integrate them and thus advance the Partnership with knowledge and content.

In the future, the EOSC-A will further clarify the roles, opportunities, and strengths arising from its diverse membership to secure synergies and highest quality of results.

4.2 Transparency and openness

The EOSC Partnership has established and maintained a number of engagement and outreach instruments to maintain transparency and openness:

The 13 EOSC-A Task Forces (TFs) are composed of roughly 400 qualified volunteers from the research community, both within and beyond the EOSC-A membership. These groups have spent the latter half of 2023 consolidating their work of the previous 18 months and delivering against their objectives. This fundamental and strategic work has resulted in 10 published deliverables validated by at least two qualified reviewers, with another 12 on track to be published over the next three months.

EOSC-A runs extensive consultations with its membership to draft the SRIA's Multi-Annual Roadmaps (MAR), also involving the EC, the EOSC-A Task Forces and the EOSC-A Board of Directors. The draft of the revised SRIA is then shared with the EC for its review and the agreed text is adopted by the Partnership Board.

The EOSC NTEs, targeting 28 countries to date, enlisting 342 speakers and panellists, and reaching some 2,300 stakeholders directly, have been jointly organised by the national stakeholders, including the country's EOSC-A Mandated Organization, together with EOSC-A, and with support from EOSC Focus. The series has had an outsize effect on building the national-level communities around EOSC, sharing the knowledge and good practices built up in the countries, and aligning strategic activities and decision-making across the MS/ACs.

The EOSC-A website, eosc.eu, was completely redesigned and relaunched in 2023, featuring country pages for 31 MS/ACs that serve as the anchor point and aggregator for the most important EOSC-related activities at the national level.

The website is used in strategic combination with social media channels (X and LinkedIn), together with a monthly newsletter, to create a continually reinforced news and information flow about the activities of the Association and the Partnership.

Included in the new website was the launch of the EOSC implementation Macro-Roadmap, which visually tracks HE project results over time and according to selected objectives and action areas of the SRIA.

The EOSC Forum is an online communications and engagement platform initiated by EOSC-A and to which 933 individuals have so far been onboarded. This represents an enormous opportunity to engage and connect the various stakeholder communities across the ecosystem.

Finally, apart from the many events organised, co-organised, and supported by the EOSC Association, EOSC Focus, and the Tripartite Collaboration, it is important to note the dozens of EOSC events organised and promoted by the EOSC-A membership and the HE EOSC-related projects. Members of the EOSC-A Board of Directors and the staff of the EOSC-A Secretariat make it a priority to ensure that there is EOSC-A representation and participation at as many of these events as possible. EOSC-A also enlists representatives from its Mandated Organisations as moderators or speakers to represent EOSC-A at national and international events. Additionally, eosc.eu, the EOSC newsletter and the EOSC Forum serve collectively as the definitive calendar of events for all things EOSC.

On the side of the EC, much effort was invested to engage the EOSC Association in the programming of the yearly INFRAEOSC Calls and to thus get hold of the requirements of the communities represented by the EOSC Association. The objective has been to design tailor-made funding activities that best integrate into the SRIA and the MARs, respectively, and that maximally support the Partnership in order to achieve the overall goals of the EOSC.

Furthermore, the EC steered the discussions and the development of possible EOSC post-2027 scenarios that involved not only the EOSC Association but also to a wider extent the EOSC Steering Board, given the important and broad nature of the topic and foreseeing a possible enhanced contribution by the member states and associated countries. This initiative to which the

EC contributed with profound content related work given the complexity of the topic including legal, governance, financial, and strategic issues, to name only a few, resulted in the discussion of the topic during the European Tripartite Event that has taken place end of November 2023 in Madrid.

The EC contributed further to a broad extent to the organisation of EOSC events, participated in national tripartite events and discussion rounds, the General Assembly of the EOSC Association and thereby was present for discussions, reflections, and adaptations of objectives and working procedures.

The work that the EC conducted together with the EOSC SB, and here especially with the Policy and Monitoring Subgroups, was regularly presented to the EOSC Association and where useful or necessary opened for their contribution.

4.3 Collaboration and synergies with other European Partnerships and initiatives/ programmes

EOSC can be seen as the European Data Space for research. The EOSC Partnership has thus so far prioritised collaboration and synergies with the European Data Spaces, including through activities of the EOSC Focus project.

The EOSC-A and the Data Spaces Support Centre (DSSC)²⁰ agreed to coordinate joint webinars that would bring together the two communities. Additionally, regular meetings between the EOSC-A Board and DSSC representatives, with the support of EOSC Focus, were initiated with the aim to create a strategic joint roadmap for the two initiatives. Three joint webinars have so far been held, focused on promoting the cross-fertilization of EOSC-related stakeholders with the Data Spaces communities (the Language, Health, Public Administration, Green Deal, and Manufacturing Data Spaces). In addition, INFRAEOSC projects have been supported by the DSSC in order to exchange experience on FAIR implementation and the development of interoperability frameworks. Links have also been established to develop synergies between the EOSC EU node and the SIMPL middleware²¹.

In parallel, EOSC Focus supported EOSC-A in producing the report, “Technical Collaboration with other European Partnerships and relevant initiatives: Focus on Common European Data Spaces”. The objective is to describe the Common European Data Spaces, their governance, scope, technical framework and to report on the actions and opportunities for mutual collaboration and cooperation in line with the objectives of the EOSC Partnership’s MoU.

EOSC-A has also joined the DSSC Strategic Stakeholder Forum (SSF), a group of key organisations active in the Data Space landscape in Europe (sectoral and cross-sectoral). The DSSC SSF is considered a think-and-do-tank that supports the DSSC in delivering on policy objectives. Together with the rest of the DSSC consortium partners, the SSF makes recommendations on the governance of the Support Centre’s assets, its evolution, and its sustainability. EOSC-A is represented by the Secretary General and one Board member.

In the future, the EOSC Partnership will explore synergies with other European initiatives and Partnerships, in particular the EuroHPC, Innovative Health Initiative, ERA for Health, Metrology and AI-Data-Robotics, as well as with EU Missions such as the ones on Adaptation to Climate change, Cancer, and Restore our Ocean and Water.

²⁰ The [DSSC](#) coordinates and supports the evolution of the Common European Data Spaces.

²¹ More info on the SIMPL middleware [here](#).

4.4 International visibility and positioning

The EOSC Partnership is achieving scientific and technological visibility and recognition in the international context as a result of the following action lines:

- The EC promotes the visibility of the EOSC Partnership in international fora such as in the G7, OECD, UN, RDA and CODATA.
- A growing number of EOSC-A members and beneficiaries of EU-funded INFRAEOSC grants are based internationally or have facilities and activities outside the EU.
- Global ambassadorship for the European R&I is taking shape through the strong profiles of many of the high-level representatives of the members of the EOSC partnership, who often have strong roots in international networks.
- Global Open Science collaboration through supporting organisational, disciplinary and interdisciplinary alignment with global initiatives. A mapping of international policy initiatives and disciplinary networks addressing global Open Science commons will become available by the end of 2023.
- Representation of the EOSC Partnership²² in the Council for National Open Science Coordination (CoNOSC), a network of national Open Science coordinators in the UN-European region, engaging national Open Science leaders in an international dialogue, to share good practices for a stronger Open Science policy framework. Representation of EOSC in the Open Science Commons Executives' Roundtable (OSCER), a high-level forum for the exchange of views, cooperation on strategy and refinement of the value proposition of OS initiatives also in collaboration with the Global Open Science Cloud (GOSC) initiative.
- Cooperation with Research Data Alliance - with over 10,000 members from 145 countries, on demonstrating potential internationalisation measures to be taken by EOSC-related EC projects to improve the sustainability potential of their Key Exploitable Results. EC's cooperation with RDA includes funding to support RDA activities as well as active participation of policy officer in several RDA Working Groups of direct relevance to EOSC.
- Contribution to the development of interoperability frameworks for FAIR sharing within disciplines and for interdisciplinary at global level through the project WorldFAIR, EU-funded under the WIDERA destination of Horizon Europe.
- Organisation of international events, such as the EOSC Symposium, and participation in the International Conference on Research Infrastructures²³.

4.5 Flexibility of implementation

The EOSC Partnership has been flexible and able to adapt to evolving needs and changing circumstances in order to best deliver on its objectives.

The EOSC-A, an organisation that was established only shortly before the beginning of the Partnership, has quickly developed in order to be able to deliver on its commitments to the Partnership and to adapt to the needs of its membership. A recent example of EOSC-A's

²² The EOSC-A president is a CoNOSC Board Member.

²³ ICRI 2022, Brno, CZ, 19-21 October 2022.

flexibility is related to the discussion around the “EOSC nodes” concept that evolved since end 2022 and was revealed during the General Assembly Meeting in May 2023. EOSC-A took up the challenge to frame the discussion around this concept that was not understood or anticipated by the community, to run consultations among its membership and the wider community, and to communicate and advocate the concept downstream.

Flexibility has also been demonstrated on the side of the EC by regularly inviting the EOSC-A to contribute its input and advice to the programming of the yearly INFRAEOSC Calls and to thus to implement newest results and requirements into the funding activities. By that, the EC has conceived to design tailor-made and up to date funding activities.

5. Lessons learned and outlook

As outlined at the introductory section, the EOSC Partnership has achieved remarkable results, including mobilising impressive investments across Europe towards delivering its objectives, moving towards a more community-driven Horizon Europe Work Programme to support EOSC, reaching out, raising awareness and supporting the structuring of national EOSC communities, and coordinating activities across a very diverse and rapidly expanding landscape of stakeholders.

At the same time, several challenges have been identified that mainly relate to the need to effectively coordinate and integrate the activities of the multitude of actors at the institutional, national and European levels towards deploying a sustainable EOSC Federation, developing a web of FAIR data and making open science the new normal among European researchers.

Looking into the next two years, the Partnership will continue to align its efforts to address challenges and emerging priorities in order to best deliver on its objectives.

To this end, it will be the key to ensure that, to the extent possible, this large mobilisation of resources is coordinated and aligned towards delivering the EOSC objectives. During the last two years there have been activities by the Partners (including through the EOSC Focus project) to support the networking and interconnection among the INFRAEOSC projects such as the cross-project HE working groups, which are generally recognised as important for collaborating, and giving the opportunity to the projects to sustainably integrate their results into EOSC. For the next two years, it will be important to continue and reinforce activities consolidating the coordination and sustainability of the EOSC ecosystem. To this end, further support is foreseen on the basis of an INFRAEOSC-2024 call that should, among others, also capitalise on the results of the activities carried out by EOSC Focus. Moreover, the Partners envision further measures to support connecting the projects and linking them to the EOSC-A, both in terms of coordinative activities and developments on a governance level.

With the operationalisation of the first EOSC node, the EOSC EU node, in 2024 and possibly the development of other EOSC nodes in the near future, it will be important for the Partnership during the next two years to facilitate and stimulate the uptake of the growing EOSC federation by the scientific community.

The overall issue of increasing the alignment and integration of the activities of the various EOSC-related stakeholders at European, national and institutional levels towards delivering the objectives of EOSC is key in the ongoing discussions related to the future sustainability of EOSC.

To ensure the long-term success of our common endeavour, the Partners will seek a broad consensus in the EOSC Tripartite Governance as regards the most appropriate option for the evolution and operation of EOSC after 2027.

6. **Annex 1: Table 2 – In-Kind Contributions**

Table 2: In-kind Contributions provided by Partners other than the European Union in the form of Additional Activities (01/06/2021-31/12/2022)

AA Category	AA Type	Link to Partnership's objectives or KPIs	Planned amount ²⁴ (M€)	Actual amount ²⁵ (M€)	Explanation of any major deviations from the AA Plan
1. Support to additional R&I	1.1 Upgrade of existing research infrastructures and e-infrastructures so that they may be federated through EOSC	SO1 SO4 SO6 SO7 SO8 OO2 OO5 OO10 OO11 OO13 AA3 AA4 AA5 AA6 AA14	107.215.223,20	116.405.130,00	Lower number of FTEs participating in the activity type than originally planned. Change of FTE conversion used - more in line with their country staff costs. Activity cancelled/postponed due to funding
	1.2 Development and deployment of EOSC-compatible search engines to allow the researchers to explore rich metadata and semantic descriptions in EOSC-connected registers	SO4 SO6 SO7 SO8 OO2 OO5 OO10 OO11 OO13 AA1 AA2 AA3 AA4 AA5 AA6 AA14	3.345.804,00	3.478.976,00	
	1.3 Deploying EOSC-Core components for FAIR (e.g. the deployment of online tools for data FAIRification or to help creating FAIR	SO1 SO6 OO5 AA2 AA3 AA5 AA6	11.582.386,00	12.193.719,00	

²⁴ From the Additional Activities Plan for 2021-2022.

²⁵ Amounts reported per category.

	Data Management Plans)	AA7 AA13			
	1.4 Development and publication of large scale studies	SO1 SO5 SO6 SO8 OO1 OO2 AA3 AA5 AA6 AA7	3.239.000,00	2.753.000,00	
	1.5 Contribution to operating core functions of a Minimum Viable EOSC ecosystem	SO1 SO5 SO6 SO7 SO8 OO1 OO5 OO10 OO11 AA1 AA3 AA4 AA5 AA6 AA14	6.782.852,00	13.648.116,00	
Total:			132.165.265,20	148.478.941,00	
2 Scale-up of technologies	2.1 Investment done complementing the results of a project, bringing it to a higher TRL level (e.g. EOSC thematic services) or to deployment	SO4 SO7 SO8 OO1 OO5 AA5 AA6 AA7	1.195.000,00	530.000,00	Discrepancies in the number of FTEs Different FTE conversion used New activities not previously reported
	2.2 Uptake of EOSC projects' outcomes through adoption of, for instance, new open specifications, standards for data interoperability, common EOSC frameworks for managing AAI, also but not exclusively in the context of public procurements	SO1 SO4 SO5 SO7 OO1 OO5 OO6 OO10 OO11 OO12 AA1 AA3 AA4 AA5 AA6	847.850,00	1.150.000,00	

		AA7 AA14			
	2.3 Implementation of technical specifications required to provide services through the EOSC	SO5 SO7 OO1 OO6 OO10 OO11 OO12 AA1 AA2 AA3 AA4 AA5 AA6 AA7 AA14	833.886,00	9.945.605,00	
Total:			2.876.736,00	11.625.605,00	
3 Demonstrators	3.1 Investment in new platforms, demonstrators, pilot use cases exploiting domain-specific user environments and supporting the EOSC vision including the value of sharing FAIR and open research data and other research digital objects such as software	SO1 SO4 SO5 SO6 SO7 SO8 OO1 OO4 OO5 OO6 OO12 AA3 AA4 AA5 AA6 AA7 AA14	63.832.416,42	21.440.346,00	Activity planned investment 60MillEUR reduced to 13 Mill EUR (amount has been prorated between different financial years)
	3.2 New (pre-)commercial services and capabilities along the data life cycle addressing current and anticipated needs of the research community at large	SO4 SO7 OO1 OO5 OO10 AA4 AA5 AA6 AA7 AA14	100.000,00	100.000,00	
Total:			63.932.416,42	21.540.346,00	
4 Creating new business	4.1 Invest in start-ups, spin-offs on solutions developed within the projects	SO8 AA14	220.000,00	136.000,00	Discrepancies in the number of FTEs

opportunities	4.2 Start incubators/accelerators	SO8 AA14	399.350,00	289.350,00	Different FTE conversion used
	4.3 Matchmaking between different start-ups, - SMEs, participating companies, stakeholders	SO8 AA13 AA14	140.000,00	121.000,00	
	4.4 Investments in procurement of innovative solutions	SO8 OO7 AA14	10.000,00	100.000,00	
Total:			769.350,00	646.350,00	
5 Training and skills development	5.1 Addressing the development of education, training and skills development in Open science and FAIR data management of research artefacts. Coordinating and aligning relevant curricula on skills for FAIR and Open Science, and training frameworks for young researchers, civil servants and policy makers	SO1 SO2 SO4 SO6 SO8 OO3 OO4 OO6 AA1 AA2 AA3 AA5 AA6 AA11 AA12 AA13 AA14	25.893.368,69	26.343.700,00	Discrepancies in the number of FTEs Different FTE conversion used
Total:			25.893.368,69	26.343.700,00	
6 Contribution to development of new standards, regulations and policies	6.1 Standardisation and certification activities related to EOSC trusted repositories (e.g. CoreTrustSeal and FAIR)	SO1 SO3 SO4 SO6 OO6 OO12 AA2 AA3 AA5 AA6 AA7 AA13	1.236.394,00	1.578.178,00	Discrepancies in the number of FTEs Different FTE conversion used New activities not previously reported
	6.2 Translate FAIR guidelines and frameworks to make them applicable to other digital objects, such as software, code, data	SO1 SO2 SO3 SO4 SO5 OO3 OO4	7.651.344,00	6.719.611,00	

	management plans, protocols	OO5 OO6 OO7 OO8 AA2 AA3 AA5 AA6 AA7 AA11 AA13 AA14			
	6.3 Continuous standardisation of PID resource types and promotion of new practices to expand the range of identifiable research objects e.g. instruments, services, organisations and software	SO1 SO2 SO3 SO4 SO5 OO1 OO4 OO7 OO8 OO11 AA1 AA2 AA3 AA5 AA6 AA7	6.306.563,00	5.906.000,00	
	6.4 Support all research communities to develop and adopt domain-specific standards and to consolidate common metadata and data schemata for use in the EOSC context	SO1 SO4 OO4 OO5 OO12 AA2 AA3 AA5 AA6 AA7	15.414.300,00	13.807.569,00	
Total:			30.608.601,00	28.011.358,00	
	7.1 Define and test financing models for a lasting long-term EOSC sustainability framework	OO13 OO14 AA9 AA10	435.000,00	339.800,00	Discrepancies in the number of FTEs Different FTE conversion used New activities not previously reported
7 Supporting ecosystem	7.2 Development of consensual EOSC frameworks and guidelines (e.g. for	SO5 OO4 OO5 OO13	570.433,00	547.000,00	

development	interoperability, AAI, the implementation of EOSC rules of participation)	AA3 AA4 AA7 AA9			
	7.3 Support to knowledge building and sharing with the research domains to support data-intensive-science and interdisciplinary research	SO1 SO4 SO8 OO2 OO4 AA1 AA2 AA3 AA9 AA11 AA13 AA14	9.053.433,00	8.028.216,00	
	7.4 Building industry-academia cooperation (e.g. GAIA-X and other industry-driven initiatives)	SO8 AA9 AA14	2.007.833,00	4.813.549,00	
	7.5 Enforcement and implementation of the EOSC Persistent Identifier (PID) policy and architecture	SO1 SO2 SO4 OO11 AA1 AA2 AA3 AA9	283.202,00	356.454,00	
	7.6 Encouraging and incentivising use of European infrastructure for sharing of research software	SO6 SO7 OO1 OO7 AA5 AA6 AA9 AA14	315.533,00	266.020,00	
	7.7 Monitoring of EOSC key performance indicators (KPI's), investments and FAIR data production and management	SO5 OO2 OO7 AA9	172.000,00	170.333,00	
	7.8 Contributing to a rewards and recognition framework that incentivises FAIR data and Open Science	SO1 SO4 OO2 OO7 OO8	5.933.633,00	3.910.216,00	

		AA3 AA12 AA13 AA9			
	7.9 Activities contributing to strategic and operational alignment, coordination and synergies with other partnerships, HE missions, initiatives, research data commons and data spaces	SO1 SO8 SO9 OO4 AA9 AA14	13.207.013,00	9.554.236,00	
	7.10 Contact points at national or institutional levels and coordination mechanisms for EOSC uptake by the research communities, infrastructure connection and FAIR implementation	SO1 SO3 SO8 OO2 OO4 AA8 AA9 AA13 AA14	1.881.733,00	5.488.171,00	
Total:			33.859.813,00	33.473.995,00	
8 Communication, dissemination, awareness raising, citizen engagement	8.1 EOSC-related communication, dissemination, outreach and awareness raising activities	SO1 SO2 SO3 SO4 SO8 OO3 OO4 AA5 AA6 AA9 AA13 AA14	4.238.400,00	3.051.737,00	Discrepancies in the number of FTEs Different FTE conversion used New activities not previously reported
	8.2 Promoting EOSC at all levels by engaging with relevant communities and stakeholders	SO1 SO3 SO8 SO9 OO4 OO5 OO7 OO8 OO9 OO14 AA13 AA14	1.272.500,00	3.422.347,40	
Total:			5.510.900,00	6.474.084,00	

9 Other	9.1 Introduction of EOSC-specific references in research programmes and EOSC-related criteria for R&I funding	SO1 SO3 SO4 OO4 AA8 AA9 AA12	15.000,00	15.000,00	Discrepancies in the number of FTEs Different FTE conversion used New activities not previously reported
	9.2 Activities in support of open publishing and initiatives to promote wider open access publication through the EOSC	SO1 SO3 SO4 OO1 OO3 AA6 AA13 AA14	6.866.512,00	5.206.455,00	
	9.3 Adoption of national or institutional strategies for digital transformation and related roadmaps including a reference to the EOSC	SO1 SO2 SO3 SO4 SO9 OO1 OO2 OO3 OO4 OO6 OO8 OO13 AA9 AA13 AA14 AA3 AA9	2.141.500,00	1.780.278,00	
	9.4 Adoption of new policies on Open Science referring to the use of the EOSC or the implementation of the FAIR principles. Definition of policy targets and action plans for the implementation of those policies	SO3 SO4 OO4 AA3 AA8 AA9	2.094.235,00	2.355.500,00	
	9.5 Liaise internationally to develop a global cooperation framework for Open Science infrastructures	SO8 SO9 AA14	5.720.000,00	6.211.349,94	
	Total:		16.837.247,00	15.568.582,94	
Grand Total:		312.453.697,31	292.162.961,94		

7. Annex 2: Table 3- Investments in operational activities

Table 3: Investments in operational activities by the Partners other than the Union in the reporting period (01/06/2021-30/06/2023)

Description	Investments in operational activities (€)	In-kind Contributions paid by beneficiaries that are <u>not</u> constituent or affiliated entities(€)	Total (€)
Upgrade of existing local/national e-infrastructures	21.350.000,00 €		21.350.000,00 €
VLO - Virtual Language Observatory harvesting harmonised metadata	20.000,00 €		20.000,00 €
Research database infrastructures and participation in international research infrastructures	11.607.332,00 €		11.607.332,00 €
Operational and technical maintenance of the existing e-infrastructure and services	162.000,00 €		162.000,00 €
Work on standards for data quality and semantic data interoperability.	90.710,00 €		90.710,00 €
Investment in new platforms, demonstrators, pilot use cases	175.000,00 €		175.000,00 €
Work by start-ups	50.000,00 €		50.000,00 €
Education, training and skills development	160.000,00 €		160.000,00 €
A webpage is maintained with a faceted overview of how the FAIR principles are implemented in the context of the organisation	10.000,00 €		10.000,00 €
Development of FAIR guidelines	21.894,00 €		21.894,00 €
European Production for avoiding self-orchestration of the value chain and learning ecosystems	196.000,00 €		196.000,00 €
Activities contributing to strategic and operational alignment, coordination and synergies with other partnerships	33.000,00 €		33.000,00 €
Activities foreseen in the Communication and Dissemination plan	76.353,00 €		76.353,00 €
Elaboration of a concrete roadmap/ action plan with indicators correlated to the EU policy recommendations	35.000,00 €		35.000,00 €
Institutional contributions to European infrastructures	1.894.000,00 €		1.894.000,00 €
Policy advice to the ministry	800.000,00 €		800.000,00 €
Grand Total:	36.681.289,00 €		36.681.289,00 €

8. Annex 3: Table 6 - *KPIs common to all*

Table 6: KPIs common to all Partnerships

N°	Criterion addressed	Common indicator	Unit of measurement	Baseline (to be defined by each Partnership)	Results at the end of the reporting period	Target 2027 or 2030 (to be defined by each Partnership)
1	Additionality	Progress towards (financial and in-kind) contributions from partners other than the Union – i.e. committed vs. actual	Million EUR	€0M	€292M	€500M (2030)
2	Additionality/ Synergies	Additional investments triggered by the EU contribution, including qualitative impacts related to additional activities	Qualitative	N/A	Since less than 20% of the Research Performing Organisations in any country are members of the Association, we estimate the monetary value of this indicator to be 5 times the value of the AAPs. With this logic, the value of this indicator, over the reporting period, is estimated in 2 Billion EUR ²⁶	€2,5 billion
3	Directionality	Overall(public and private, in-kind and cash) investments mobilised towards EU priorities	% of the total Partnership budget	N/A	65 % (Considering both EU budget for projects and the prorated additional activities by the panthers.	100%
4	Transparency and openness	Measures ensuring continuous openness and transparency and dedicated activities as they are more concrete and call to action	Qualitative	N/A	General Assemblies National Tripartite events Tripartite collaboration Task Forces Community-wide consultation on multiannual roadmaps	

²⁶ Methodology: This value is calculated as the yearly additional contribution by members, based on the total value of AAR2022, multiplied by 5 (five).

N°	Criterion addressed	Common indicator	Unit of measurement	Baseline (to be defined by each Partnership)	Results at the end of the reporting period	Target 2027 or 2030 (to be defined by each Partnership)
5	Transparency and openness	Newcomer members that have joined the Partnership (disaggregated per type and countries of origin)	% of total members	N=185	N total members: 256 (+40%) N newcomers: 71 – RPOs: 43 SPs: 12 RFOs: 2 Mixed scope: 14 – EU MSs: 56 EU ACs: 10 International:5 Widening countries: 11	Broader membership base
6	Transparency and openness	Newcomer beneficiaries in funded projects (disaggregated per type and countries of origin)	Number	N/A	total N.: 19 – RPOs: 11 SPs:5 Mixed scope: 3 – EU MSs:12 International:2	widening participation
7	Coherence and synergies	Coordinated and joint activities with other European Partnerships and EU Missions	<i>Qualitative</i>	N/A	Coordinated and joint activities with two Clusters Partnerships and three EU Missions. Cluster 1 Partnerships: Health: - Innovative Health Initiative - ERA for Health Cluster 4 Partnerships: Digital, industry and space: - High Performance Computing - Metrology - AI-Data-Robotics EU Missions: - Adaptation to Climate change - Cancer - Restore our Ocean and Waters	Expand on the coordinated and joint activities with other European Partnerships and EU Missions.
8 ²⁷	Coherence and synergies	Complementary and cumulative funding from other Union funds (national funding, Cohesion Policy	% of the total Partnership	N/A	N/A but members of the EOSC-A use use fundings from the national/regional/structural funds for the EOSC-related investments and in-kind contributions, which are reported in the AAPs.	N/A

²⁷ The information on KPI no. 8 should be provided by the Partnership, via a survey among the constituent or affiliated entities of the Partners other than the Union.

N°	Criterion addressed	Common indicator	Unit of measurement	Baseline (to be defined by each Partnership)	Results at the end of the reporting period	Target 2027 or 2030 (to be defined by each Partnership)
		Funds, RRF, CEF, DEP, other)	p budget		The EOSC partnership does not hold a budget from national/regional funding streams, for either calls or any other activity. EOSC-A financial resources only come from membership fees or from the Union. On the other hand, several Members of the EOSC-A use national/regional/structural funds, in line with the programme in their country. Please refer to the Common Indicators Survey for more information - Common Indicator number 8.	
9	International visibility and positioning	Visibility of the Partnership in national, European, international policy/industry cycles	Qualitative	N/A	<p>Growing EOSC-A membership 256 members (172 Members; 84 Observers)</p> <p>EOSC brand established</p> <p>EOSC website: more than 8.000 views a month, 4 times above KPI target (D1.1)</p> <p>X followers growing by 7% per month. LinkedIn growing by 12% .</p> <p>Monthly newsletters</p> <p>National Tripartite Events (Jan 2022 - Jun 2023) Total number of participants: 2176 Total number of speakers, moderators and panellists: 343 Total number of countries targeted: 25</p> <p>Participation/organisation of eu/international events (e.g.: EOSC Symposium 2021 and 2022, ICRI2022)</p>	Continue the effort to increase international visibility and positioning.
10	Alignment of national / regional / sectorial policies (strategic level)	The degree to which national policies/ priorities are reflected in the SRIAs and the degree to which the SRIAs influence national policies and strategies	Qualitative	N/A	<p>The alignment of policies and strategies can be achieved through the following four activities run by the EOSC-A:</p> <ol style="list-style-type: none"> 1. Collaboration between the EOSC-A and Mandated Organisations (MOs); 2. EOSC Tripartite Events and EOSC National Tripartite Events; 3. EOSC National Structures; 4. Collaboration with the EOSC Steering Board (EOSC-SB). 	Continue the effort to align of national/ regional/ sectorial policies (strategic level)