EOSC Future

D1.5

Compendium of EOSC Opportunities and Challenges

eoscfuture.eu

Version 2.0
October 2023

D1.5 / Compendium of EOSC Opportunities and Challenges

Lead by **EGI Foundation**
Authored by Dale Robertson (EGI Foundation), Smitesh Jain (EGI Foundation), Lennart Stoy (TGB), with contributions by Malcolm Bain (Across Legal) and Lucrezia Berto (Across Legal)

Reviewed by Sara Garavelli (CSC) & Athanasia Spiliotopoulou (JNP)

Dissemination Level of the Document

Public

Abstract

This deliverable presents the main opportunities and challenges presented by the Key Exploitable Results defined for the EOSC Future project and describes requirements and ongoing work relating to their exploitation.

Version History

Version	Date	Authors/Contributors	Description
V0.1	01/11/2022	Dale Robertson (EGI Foundation)	Initiation – Proposed ToC
V0.2	05/01/2023	Dale Robertson (EGI Foundation)	Drafting Chapter 2, updated ToC
V0.3	14/04/2023	Lennart Stoy (Technopolis Group)	Section 2.1
V0.4	24/04/2023	Dale Robertson, Smitesh Jain (EGI Foundation)	Chapter 3
V0.5	25/04/2023	Dale Robertson (EGI Foundation)	Chapter 4 and part of chapter 5
V0.6	09/05/2023	Dale Robertson (EGI Foundation)	Executive Summary, remainder of chapter 5
V0.7	06-12/05/2023	KER Champions: Diego Scardaci (EGI), Klaas Wierenga (GÉANT), Ian Bird (ESCAPE), Matthew Viljoen (EGI), Christos Arvanitidis (LifeWatch ERIC), Andreas Petzold (ENVRI), Natalia Manola (OpenAIRE), Gareth O'Neill (Technopolis Group), Michelle Williams (GÉANT), Paolo Manghi (OpenAIRE), Shanmugasundaram Venkataraman (OpenAIRE), John Shepherdson (CESSDA), Veronika di Luna (GÉANT), Giovanni Lamanna (ESCAPE), Ron Dekker (Technopolis Group), Sara Garavelli (CSC)	Edits and comments throughout
V0 .8	15/05/2023	Lennart Stoy (Technopolis Group)	Glossary, Abbreviations
V0.9	16-17/05/2023	Dale Robertson, Smitesh Jain (EGI Foundation)	Addressing edits and comments
V1.0	17/05/2023	Dale Robertson (EGI Foundation)	Final draft for internal review
V1.1	31/05/2023	Dale Robertson (EGI Foundation), Smitesh Jain (EGI Foundation), Lennart Stoy (TGB), Ron Dekker (TGB), Mike Chatzopoulos (ATHENA)	Final Version submitted to EC
V1.2	12/09/2023	Dale Robertson, (EGI Foundation), Malcolm Bain (Across Legal), Lucrezia Berto (Across Legal), John Shepherdson (CESSDA)	Updates in response to M24 EC review comments
V1.3	25/09/2023	Dale Robertson (EGI Foundation), Smitesh Jain (EGI Foundation), Gareth O'Neill (TGB)	Updates following project General Assembly meeting, and reflecting other developments
V1.4	25/10/2023	Dale Robertson (EGI Foundation)	Final updates following internal review
V1.5	26/10/2023	Dale Robertson (EGI Foundation)	Preparation for circulation and submission
V2.0	31/10/2023	Dale Robertson (EGI Foundation), Smitesh Jain (EGI Foundation), Lennart Stoy (TGB), Ron Dekker (TGB), Mike Chatzopoulos (ATHENA)	Revised version submitted to EC

Copyright Notice

Table of Contents

Table of Tables

Table of Figures

Glossary

The EOSC Future project Glossary is incorporated by reference: https://wiki.eoscfuture.eu/x/JQCK. Additional terms relevant for this deliverable are defined below:

Term	Definition

Background*	means any and all data, information or know-how (tangible or intangible) whatever its form or nature, including any IPRs that is/are:
	    I. owned by a Party or that a Party has a right to license, prior to the Effective Date or
	    II. developed or acquired by a Party independently from the work in the Action even if in parallel with the performance of the Action,
	but solely to the extent that such data, information, know-how and/or IPRs are used in or introduced into the Action by the Party who owns or has the right to license it.

Exploitation / Exploit*	the direct or indirect use of Results in
	    I. further research activities other than those covered by the Action, or
	    II. developing, creating, or marketing a product, or process, or
	    III. creating and providing a service, or
	    IV. standardisation activities.

Foreground	*See 'Result(s)'*
Intellectual Property Rights / IPR(s)*	patents, patent applications and other statutory rights in inventions; copyrights (including without limitation copyrights in Software); registered design rights, applications for registered design rights, unregistered design rights and other statutory rights in designs; and other similar or equivalent forms of statutory protection, wherever in the world arising or available, but excluding rights in Confidential Information and/or trade secrets.
Key Exploitable Result (KER)	an identified main interesting result, which has been selected and prioritized due to its high potential to be 'exploited' – meaning to make use and derive benefits-downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education. (Source: https://intellectual-property-helpdesk.ec.europa.eu/system/files/2022-02/HEU%20Results%20platform.pdf)
Result(s)*	any tangible or intangible output of the Action, such as data, knowledge, and information whatever their form or nature, whether or not they can be protected, which are generated in the Action as well as any rights attached to them, including Intellectual Property Rights.
Software*	sequences of instructions to carry out a process in, or convertible into, a form executable by a computer and fixed in any tangible medium of expression.

Terms marked with an asterisk (*) as defined by the Consortium Agreement

List of Abbreviations

Acronym	Definition
AAI	Authentication and Authorisation Infrastructure
AAP	Additional Activities Plan
CA	Consortium Agreement
CC BY	Creative Commons Attribution license
CSA	Coordination and Support Action
EC	European Commission
EOSC	European Open Science Cloud
EOSC DIH	EOSC Digital Innovation Hubs
EOSC IF	EOSC Interoperability Framework
EOSC KH	EOSC Knowledge Hub
FAIR	Findable, accessible, interoperable, re-usable
IP	Intellectual property
IPR	Intellectual property right
KER	Key exploitable result
KPI	Key performance indicator
LMS	Learning Management System
OCRE	Open Clouds for Research Environments (project)
SME	Small or medium sized enterprise
SRIA	EOSC Strategic Research and Innovation Agenda

1 Executive Summary

This deliverable identifies and discusses the key opportunities and challenges relating to exploitation of the Key Exploitable Results (KERs) of the EOSC Future project.

A procurement process is taking place to operate EOSC Core and some Exchange services for three years from 2024. The importance of the EOSC Future results for the future development of EOSC, together with the complex and evolving EOSC environment, makes it essential to ensure the project's results are appropriately and adequately protected, and that they can also be exploited for the benefit of their owners.

The project's innovation management approach has identified what assets the project is producing and grouped them under the KERs. The results have been assessed to determine who owns them, to identify background, third-party, sideground and foreground Intellectual Property of relevance, and their IP protection and licensing. The assigned IP protection and licensing is being assessed for its suitability for the expected future exploitation of the results, and any necessary changes made. Joint ownership agreements will be concluded for the jointly owned results. Presentation and ongoing management and maintenance of the IP results information is also being addressed, to ensure the usability of the results. Transfer of ownership of results, previously expected to be a condition of the EC procurement which will exploit many of the project's results, is no longer required.

A total of 40 individual project results (foreground) have been identified under the KERs. Some simplification has taken place recently to reduce the number of results. It was also concluded that the envisaged KER (KER8 – EOSC Community) providing contact information about the EOSC Community was not viable due to complications relating to data protection and privacy. Work to identify and detail the individual project results[1] is still ongoing.

The most significant opportunity for EOSC Future, in terms of exploitation, is contributing to the further development of EOSC, through the use of many of the results in KERs 1 (EOSC Core and Support), 2 (EOSC Exchange), 5 (EOSC Interoperability Framework) and 6 (EOSC Knowledge Hub) in the EC procurement. Exploitation of the results in the other KERs will also enhance the value and functionality of EOSC in important ways. The procurement contract, which will be concluded between the EC and the winning bidder(s), regulates the rights over the results of the EC procurement (i.e. its exploitable outputs) and the background that is brought to the (start of the) procurement, which are evolutions of outputs from the EOSC Future project. Around half of the EOSC Future project results will be included in the procurement. The contractor awarded under Lot 1 of the EC procurement brings the procurement background to the procurement project and builds on this. It must warrant that this procurement background and all other background materials in the procurement are free of claims and all the necessary rights have been obtained or licenced. The EOSC Future results licences must therefore enable this.

The M24 EC review report requires EOSC stakeholders and the open-source community to be able to reuse EOSC Future results based on open-source and open-access schemes. It defined a list of specific information categories which have to be furnished for each project result.

Challenges relating to the IP work are:

- The scale and scope of EOSC Future mean the job of collecting the required information is very substantial.

- There is a lack of knowledge and expertise amongst project participants about the specialised area of intellectual property, making it difficult and slow to gather the required information. This is perhaps the biggest challenge facing the Innovation and Exploitation Task in the project.

- Many of the results are jointly owned.

---

[1] Descriptions of the KERs and their individual project results is collected in the EOSC Future Confluence project wiki at https://wiki.eoscfuture.eu/display/EOSCF/Exploitation (login required).

- The handover and usability of the IP results, particularly for the software components destined for exploitation in the EC procurement, also needs to be addressed. This concerns where and how the results' IP-related information is provided and how it is managed and maintained in future.

To address these requirements and challenges, the project has retained specialist IP lawyers to advise and guide the IP-related work and has updated the templates in use to collect IP-related information, in response to the M24 EC Review Report.

Project partners who contribute to the project's exploitable results are being supported by Task 1.4 and the lawyers to take steps targeting publication and management of the results as open source or open content, published in an open online repository, enabling (a) general public access to the results and (b) a legal, technical and organisational infrastructure for future evolution of the result and sustainability.

Ongoing work in T1.4 therefore includes:

- continued IP and related information gathering for project results;

- clearance of inbound and outbound licencing and ownership information for the project results (due diligence);

- updating Attachment 1 to the Consortium Agreement to accurately reflect all background IP to be protected;

- discussion in the EOSC Future General Assembly of an overall project approach to IP in support of longer-term exploitation, evolution and maintenance of the results from an IP perspective;

- drafting, conclusion and signature of Joint Ownership Agreements (JOAs) for the jointly owned results;

- availability and presentation of the results in a manner and location which supports the project's open source commitments;

- communication with the EOSC Association about use of the EOSC trademark.

The exploitation opportunities – notably the EC procurement – require that a complete set of relevant IP and related information is made available by the project to the EC in a timely manner. For the results in the EC procurement, this means by late October 2023. The information to be handed over includes the completed template (see Appendix A) for each result, in Word/PDF format, together with the information relating to the relevant results in GitHub.

The EOSC Future Key Exploitable Results are key assets for EOSC, produced by very successful collaboration between the research clusters and the European e-Infrastructures, whose value should be recognised, and steps taken to ensure further such collaboration in future.

2 Introduction

This deliverable identifies and discusses the key opportunities and challenges relating to exploitation of the eight Key Exploitable Results of the EOSC Future project.

2.1 Context

EOSC Future is operating in a complex and dynamic environment consisting of the EOSC partnership[2] between the European Commission and the EOSC Association[3], forming a tripartite governance for EOSC together with the EU member states and associated countries in the EOSC Steering Board[4]. The general framework of the collaboration is defined in the EOSC Strategic Research and Innovation Agenda (SRIA)[5]. Numerous EOSC-related projects funded through Horizon 2020 and Horizon Europe contribute towards the objectives defined in the SRIA. EOSC is being implemented in the wider context of an emergent ecosystem of European data spaces[6].

Against this backdrop, EOSC Future is not only producing results in the form of reports, code and knowledge, including publications, but also operating or supporting EOSC Core and EOSC Exchange services, developing the EOSC Interoperability Framework, the EOSC Observatory for monitoring EOSC-relevant developments, the EOSC Knowledge Hub of training and other resources, and many other activities which contribute substantially to progressing the development of the EOSC. The project also includes ten Science Projects which are delivering cross-disciplinary results and demonstrating the value and potential of EOSC to stimulate new forms of scientific collaboration and supporting scientific breakthroughs.

The project has been extended to March 2024. A procurement process is taking place, led by the European Commission, to operate EOSC Core and some Exchange services for three years from 2024. EOSC Future has contributed information which was taken into account by the EC in formulating the procurement call, and it is expected that the procurement will build directly on many of the results being produced within EOSC Future.

Through the Grant Agreement and its internal Consortium Agreement, EOSC Future is committed to the open status of project results wherever feasible.

The potential change of operators of the EOSC Core and some Exchange services which may result from the EC procurement[7] exercise demands that a careful approach is taken to the IP protection and exploitation plans for the project's results.

The importance of the EOSC Future results for the future development of EOSC, together with the complex and evolving EOSC environment, makes it very important to ensure the project's results are appropriately and adequately protected, and that they can also be exploited for the benefit of their owners.

2.2 Exploitation and Innovation Process

The Exploitation and Innovation task (T1.4) works to capture, evaluate, and refine innovations emerging from the EOSC Future project, preparing them for dissemination and exploitation. An innovation management approach has been developed and implemented, to capture opportunities stemming from project activities. The process is illustrated in figure 2.1. Project results and exploitation activities have been analysed and refined to define Key Exploitable Results (KERs) – essentially, identifying what assets the project is producing.

The project results grouped under the KERs have been assessed to determine who owns them, to identify background, third-party, sideground and foreground Intellectual Property of relevance, their dependencies on third-party components, and their IP protection. The assigned IP protection is being assessed for its suitability for the expected future exploitation of the results, and any necessary changes made. An overall approach to the IP results of the project has been recommended at the level of the General Assembly and is under discussion.

Joint Ownership Agreements will be concluded for the jointly owned results. Presentation and ongoing management and maintenance of the IP results information are also being addressed to ensure the usability of the results. Transfer of ownership of results, expected at the project proposal stage to be a condition of the EC procurement which will exploit many of the project's results, is no longer required.
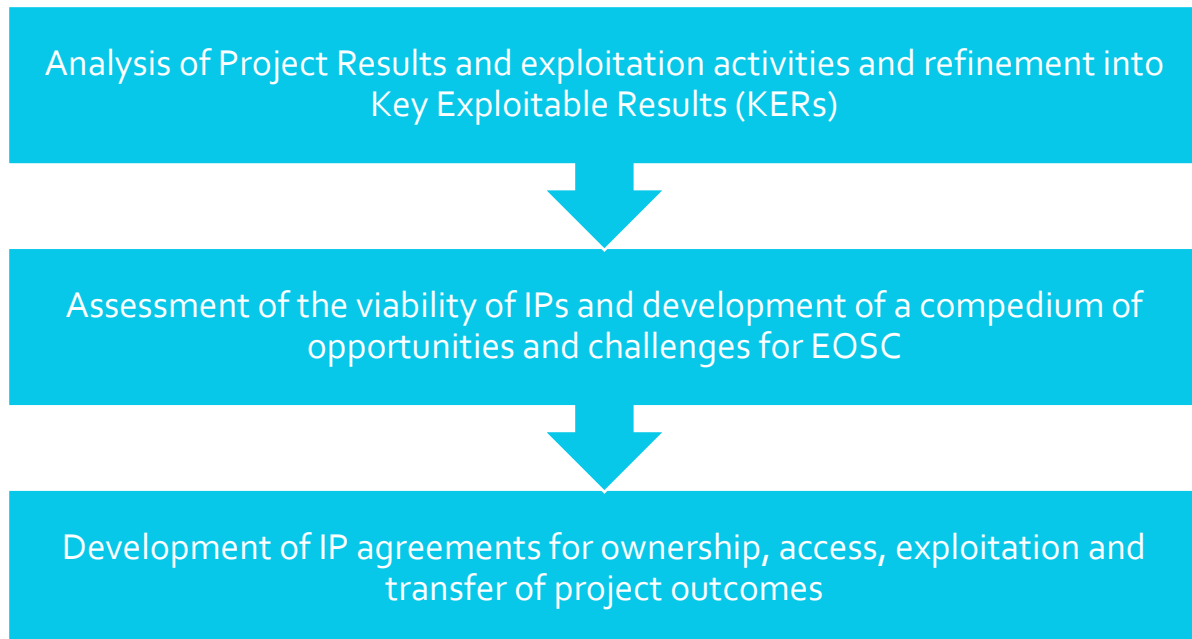
Analysis of Project Results and exploitation activities and refinement into Key Exploitable Results (KERs)

Assessment of the viability of IPs and development of a compedium of opportunities and challenges for EOSC

Development of IP agreements for ownership, access, exploitation and transfer of project outcomes

Figure 2.1 Innovation Management Approach

This Deliverable discusses opportunities and challenges relating to the EOSC Future KERs. It describes the ongoing work to prepare the IP and related information to support the exploitation of the project's results, and details how and when the detailed IP results information will be provided to the EC.

The Innovation Management process identified eight Key Exploitable Results (KERs) for the project, for which descriptions and other information were elaborated in pages in the project private wiki[8] based on the Horizon Results Platform template. The KERs are promoted via the EOSC Future website[9]. Each KER is an 'umbrella', grouping several individual project results together. Details of the innovative aspects of each result are described in a wiki page, together with relevant intellectual property (IP) information[10].

Innovation and exploitation management is an ongoing process for capturing, evaluating, and refining innovations emerging from the EOSC Future project, preparing them for dissemination and exploitation. Recently, KER8 (EOSC Community) was removed from the list of KERs. Descriptive and explanatory information about KER8 is still provided in the following chapters for completeness. Table 2-1 summarises the current number of project results per KER. There are forty individual results in total, of which around half are believed to be of relevance to the EC procurement.

Table 2-1: Current Number of Individual Project Results per KER

KER number	KER Title	Number of Individual Project Results
1	EOSC Core and Support	19
2	EOSC Exchange	3
3	EOSC Science Projects	10
4	EOSC Observatory	4

---

[8] See the catalogue of key exploitable results at
https://wiki.eoscfuture.eu/display/EOSCF/Catalogue+of+Key+Exploitable+Results (login required)
[9] https://eoscfuture.eu/key-exploitable-results/
[10] See the catalogue of individual project results at
https://wiki.eoscfuture.eu/display/EOSCF/Catalogue+of+Project+Results (login required)

5	EOSC Interoperability Framework	1
6	EOSC Knowledge Hub	1
7	Commercial Services and Support	2
	Total	**40**

For each KER, two 'KER Champions' were appointed by the project to act as ambassadors. Details of the KERs and the individual project results have been collected via interviews with the KER Champions and the results owners, together with many contributions made to the online templates and via email correspondence.

The next chapter describes each of the KERs and their main exploitation opportunities; chapter 4 discusses exploitation challenges; chapter 5 describes ongoing work, and chapter 6 provides some very brief conclusions.

3 Summary of EOSC Future KERs and their Main Opportunities

Eight Key Exploitable Results were defined for EOSC Future. KER8 (EOSC Community) was subsequently dropped from this list but its description is provided here for information. The KERs focus on the *exploitable* results of the project, distilled from the full list of results by discussion with EOSC Future Work Package and Pillar leaders and members of the Strategy and Oversight Board. Not all project results are exploitable: exploitable results are those which will be further used or built upon in future. They reflect the combined understanding, expectation, and ambition within EOSC Future for how EOSC should evolve after the end of the project.

The EOSC Future Key Exploitable Results and their individual project results are summarised briefly below, together with the key opportunities which have been identified for each. Full definition of the KERs and their individual project results is available on the project wiki[11] and will be reported to the European Commission to meet exploitation requirements. For details see section 5.4.

3.1 KER1: EOSC Core and Support

3.1.1 Description

The EOSC Core and Support provides an essential set of internal services and support activities which allow EOSC to operate and provide the ability to seamlessly share, access and combine a multitude of research services and resources. It provides a common channel for researchers, removes fragmentation, and enables cross-disciplinary collaboration across disparate research communities, allowing researchers to use resources from different communities to produce ground-breaking new research results. The EOSC Core increases re-use of research outputs, supports Open Science principles, maximises the value of research investment, facilitates multi-disciplinarity and widens the user base of research.

3.1.2 Unique Value Proposition

The EOSC Core and Support provides the ability to seamlessly share, access and combine individual resources across research communities.

- **Motivation:** EOSC Core and Support removes fragmentation and enables collaboration between separate research communities, making cross-disciplinary collaboration possible by providing a common channel through which to share and access a multitude of research services and resources.

- **Key Impact and Benefits:** Essential set of services and support allowing researchers to combine resources from different communities to produce ground-breaking new research results, increasing re-use, maximising the value of research investment, facilitating multi-disciplinarity and widening the user base of research.

3.1.3 KER1 Individual Project Results

The current list of nineteen KER1 individual project results is below. Ongoing elaboration of their details may result in some changes.

---
[11] https://wiki.eoscfuture.eu/display/EOSCF/Exploitation

- EOSC Order Management System
- EOSC AAI Federation
- Connecting EOSC Core Components to the EOSC AAI Federation
- EOSC Core Helpdesk
- EOSC Collaboration Systems
- EOSC Monitoring
- EOSC Accounting for Services
- EOSC Accounting for Research Products
- EOSC Configuration Management System
- EOSC Security Coordination
- EOSC Service Management System
- EOSC Web Presence
- EOSC Core Support
- EOSC Open Science Support
- EOSC Open Science Helpdesk and Collaborative Tools
- EOSC Open Science Metrics
- EOSC Resource Catalogue (Service Provider Portal)
- EOSC Resource Catalogue (Research Product Provider Portal)
- EOSC Marketplace

3.1.4   KER1 Key Opportunities

The key opportunity relating to KER1 is that many of its components will contribute to Lot 1 of the EC EOSC procurement and therefore will provide the basis for the operational EOSC Core for at least the next three years. The Core components have been developed by teams which gather unparalleled experience and expertise in developing software for the European research community, working in tandem with the research clusters to identify and meet requirements arising from the Science Clusters, and so represent enormous value for EOSC.

One component worthy of particular mention is the Service Management System (SMS). This is defined as one project result but in practice it incorporates thirteen separate processes and around 50 procedures relating to service management. The EOSC Onboarding team and its policies and procedures are included as part of the SMS, and the SMS is included in the scope of Lot1 of the EC procurement, so information on this significant activity (i.e. the Onboarding) within EOSC Future will be included in the project results made available to be exploited in the procurement despite not being specifically named as a component of KER1.

3.2   KER2: EOSC Exchange

3.2.1   Description

The EOSC Exchange consists of a catalogue and marketplace which are made up of components including onboarding workflow and data transfer services, service and research product catalogues and dashboards, and EOSC resource search, discovery and recommender services. Together, these allow users to access, order and share a very wide range of research expertise and resources for storing, preserving and exploiting FAIR data and encouraging its re-use across the research community, maximising the value of research investment.

The EOSC Core provides the backend, non-researcher facing services essential for EOSC, whereas the Exchange provides user- and provider-facing functionality which unlocks the potential of data, providing the opportunity for science communities to expose and share the services, tools, software etc they have developed and refined over many years, for the benefit of other communities and larger-scale collaboration, and for potential wider exploitation. e-Infrastructures provide more generic, 'horizontal' services which are widely required in the scientific community.

3.2.2   Unique Value Proposition

An access point through which a very wide range of research expertise and resources can be discovered, ordered, and shared across the research community, to encourage re-use and maximise the value of research investment.

- **Motivation:** The EOSC Exchange adds significant user value to EOSC, providing its catalogue and marketplace so resources can be advertised to a wider range of users, amplifying the potential of the research clusters by exposing their resources more widely.

- **Key impact and benefits:** Key for connecting users and resources, encouraging re-use and maximising the value of research investment. Implements one of the key building blocks of EOSC as described in the Sustainability Working Group FAIR Lady report[12], providing a means to integrate resources with the EOSC Core.

3.2.3   KER2 Individual Project Results

The three individual results which make up KER2 are also part of KER1. The emphasis in each KER is different however: KER1 takes a more software-oriented view which emphasises the results' functional capabilities as part of the backend of EOSC, whilst KER2 takes a more qualitative approach and focusses on the effects and value of the components as user- and provider-facing parts of EOSC. From the point of view of the EC EOSC procurement, there is no significant distinction between KERs 1 and 2, however the purposes and value propositions of the two KERs are distinct.

- EOSC Resource Catalogue (Service Provider Portal)
- EOSC Resource Catalogue (Research Product Provider Portal)
- EOSC Marketplace

3.2.4   KER2 Key Opportunities

The EOSC Exchange, in the form of the Catalogues and Marketplace, provides the opportunity for the science communities to expose their resources more broadly – data, software, services, publications - for possible use by others, including by other scientific communities; users of EOSC are provided with the opportunity to find resources of use to them. As can be seen from its description and unique value proposition, EOSC Exchange is a fundamental asset for EOSC, without which EOSC lacks the facility to expose resources to users, and hence to contribute to Open Science.

The Catalogues and Marketplace are included in the scope of the ongoing EC procurement of the EOSC Core and elements of the Exchange, providing them with a future exploitation and sustainability path, at least for the next three years.

3.3   KER3: EOSC Science Projects

3.3.1   Description

The EOSC Future Science Projects implement interdisciplinary use cases which use EOSC resources and tools to improve cross-disciplinary research and collaboration. These Science Projects break down the barriers between research communities, they invest in the 'trading zones' between the Science Clusters and e-Infrastructures and show how EOSC can be used to create knowledge from inter-working between communities. Their potential stems from the fact that: (i) data, services and any other kind of research resource can be used by multiple communities, including from different domains, in any combination that is technically possible, and (ii) different communities can test the same hypotheses and compare their results. This potential is only realised thanks to the EOSC platform.

3.3.2   Unique Value Proposition

The EOSC Science Projects demonstrate how data, services and any other kind of research resource can be used by multiple research communities, from different domains, and allow different communities to test the same

---

[12] Available from https://op.europa.eu/en/publication-detail/-/publication/581d82a4-2ed6-11eb-b27b-01aa75ed71a1

hypotheses and compare their results. They show the commitment of the science clusters/research infrastructures to open science, making their work open and available to a broader audience. This can only be achieved thanks to the integration and composability provided by EOSC.

- **Motivation:** The innovation was, and still is, needed for two major reasons:
    - The growing societal challenges (and demands) on major issues, such as health, environment and society. Such demands cannot be tackled any longer by individual research approaches; they need integration, common efforts by following the same approaches and by using the same resources. Only such efforts would break down current barriers between disciplines and domains in science and would produce synthetic knowledge, that is, knowledge based on evidence deriving from multiple disciplines and domains, or in other words knowledge that cannot be ignored or challenged.
    - The growing demand in all the scientific communities to be able to use resources developed in different disciplines or even domains. There is no future if the communities (both scientific and engineering) work in isolation in order to solve similar problems such as the discovery, storage and management of the data they need or the analytical services they require to analyse them.

    Both these reasons bring the communities together and reveal their 'trading zones', that is, their collaborative interfaces, which are the most fruitful areas for the development of science and innovation. This can only happen through their participation in the development of the EOSC platform.

    The Science Projects demonstrate how to seamlessly integrate services and resources from different research disciplines to perform cross-disciplinary collaborations, proving the concept of the EOSC.

- **Key Impact and Benefits:**
    - Impacts: tackling major societal challenges (e.g. climate change, health); transforming the way scientific knowledge is produced today into a more integrative and inclusive way.
- **Advantages**: scientific communities have access to a plethora of data and analytical sources developed in different disciplines and domains from a single place; evidence-based science has the potential to create synthetic knowledge from testing the same hypothesis by multiple disciplines and domains.

3.3.3   KER3 Individual Project Results

The list of KER3 individual project results – simply, the list of Science Projects - is below.
- NIS-IMPACT
- Dashboard on the State of the Environment
- Covid-19
- Life Imaging Data in EOSC
- Dark Matter
- Extreme Universe
- Tracing Bio-Structures
- Dynamics of Biological Processes
- Climate Neutral and Smart Cities
- Access Management for Distributed RIs (ARIA)

3.3.4   KER3 Key Opportunities

The main opportunity of KER3 is that its results are outputs from interdisciplinary cooperation involving EOSC resources and tools, providing evidence of the commitment of the science clusters/research infrastructures to open science. The existence of a platform encouraging and enabling research communities to work together may change the way scientific knowledge is created. The Science Projects provide proof of the value of EOSC, and of the need for EOSC in support of cross-disciplinary research and collaboration, and therefore provide high-value collateral for making the case for EOSC. It is this specific aspect of the Science Projects which is exploitable from the point of view of EOSC Future, and therefore the Science Projects' dissemination results (for example

presentation slides or videos), rather than their other results (for example new or updated workflows or algorithms, or new combined datasets), which is the focus of the IP-related work.

3.4   KER4: EOSC Observatory

3.4.1   Description

The EOSC Observatory is a policy intelligence tool for monitoring the implementation and uptake of EOSC and Open Science at national and institutional levels in Europe. It supports the monitoring activities and alignment of relevant surveys related to EOSC for the EOSC Tripartite Governance. The observatory consists of an interactive dashboard to collect and display validated data on policies, practices, and investments related to EOSC and Open Science across the eight thematic categories of publications, data, software, services, infrastructure, skills/training, assessment, and engagement. The observatory supports the research and innovation community in tracking the progress of the implementation of EOSC and Open Science as well as helping policy makers, research-performing and research-funding organisations, and interested stakeholders in developing policies and practices for EOSC and Open Science.

3.4.2   Unique Value Proposition

The EOSC Observatory provides a single joint capacity to support the monitoring of the implementation and uptake of EOSC and Open Science in Europe with validated data from national and institutional stakeholders.

- **Motivation:** The observatory supports the need of the EOSC Tripartite Governance for a single tool to monitor and align the implementation and evolution of EOSC and Open Science in Europe;

- **Key impact and benefits:** The Observatory supports Member States and Associated Countries in collecting and sharing national data as well as mutual learning and development of policies and practices for EOSC and Open Science. The observatory further supports research-performing and research-funding organisations as well as the wider research and innovation community in tracking the evolution and development of local policies and practices for EOSC and Open Science.

3.4.3   List of KER4 Individual Project Results

The EOSC Observatory consists of four main types of outputs for further exploitation after the project:

- EOSC Observatory Monitoring Framework for EOSC Steering Board
- EOSC Observatory Platform
- EOSC Observatory Surveys and Data
- EOSC Observatory Documentation.

3.4.4   KER4 Key Opportunities

The short-term sustainability of the EOSC Observatory will be ensured through a dedicated Horizon Europe project, a Coordination and Support Action dedicated to 'Implementation of the EOSC Monitoring Mechanism' after the end of EOSC Future. The CSA will support the operation, maintenance, and further development of the observatory as well as continue the support to the EOSC Steering Board to conduct the annual surveys on National Contributions to EOSC. The CSA may further develop the support to the EOSC Association in conducting the annual surveys on Key Performance Indicators (KPIs) and the Additional Activities Plan (AAP) which are aimed at the members of the EOSC Association.

The data that is currently being collected via the Observatory for the EOSC Steering Board, on National Contributions to EOSC, is not only relevant for Member States and Associated Countries and the EOSC Tripartite Governance. This data is also highly relevant for the European Research Area Monitoring Mechanism[13] and may in future provide data for the monitoring mechanism indicators, especially with respect to Action 1 on 'Enable Open Science, including through the EOSC' as well as possibly for other actions such as Action 2 on 'Propose an EU Copyright and Data Legislative Framework for Research', Action 3 on 'Reform the Assessment

---

[13] See: https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/european-commission-launches-survey-evaluate-european-research-area-policy-framework-2021-03-31_en

System for Research, Researchers, and Institutions', and Action 14 on 'Bring Science Closer to Citizens'[14]. This data is also highly relevant for national and topical expert groups of the European Commission, including the National Points of Reference on Scientific Information (NPR)[15] expert group which will be exploiting the data collected from the EOSC Steering Board surveys 2021 and 2022 to draft the report on the implementation of Commission Recommendation 2018/790 on Access to and Preservation of Scientific Information[16] in 2023.

3.5 KER5: EOSC Interoperability Framework

3.5.1 Description

The EOSC Interoperability Framework (EOSC IF) is a set of guidelines which promote standards and community best practices within EOSC. Because EOSC is a system of systems infrastructure, interoperability is essential to deliver services to users and enable sharing and composability of resources, where currently possible.

The EOSC IF facilitates the interoperability capabilities of EOSC-Core services and EOSC-Exchange resources across the boundaries of e-infrastructures and research infrastructures. The EOSC IF is supported by a registry consisting of a collection of onboarding guidelines to which resources can refer so as to specify their interoperability features. The registry can be used to host metadata relating to guidelines and reference which resources comply with them, and as such is the first attempt to establish a bottom-up framework to describe (and exploit for discovery and composability purposes) resource interoperability capabilities across different domains. The EOSC IF is also supported by a governance structure that will manage the set of interoperability guidelines.

3.5.2 Unique Value Proposition

The EOSC IF tailored specifically to EOSC is essential for allowing the interoperability of resources, and their seamless integration with EOSC Core and Exchange.

- **Motivation**: To meet the needs of complex interdisciplinary research and composability of services and resources, where currently possible, is essential to ensure interoperability.

- **Key impact and benefits**: The EOSC IF breaks down silos; prevents lock-in; supports reuse, reproducibility, and collaboration; and enhances value-for-money of research outputs. By promoting the adoption of existing standards and best practices rather than creating new ones it will make it easier for research collaborations to share their resources. The EOSC IF Registry will enable the realization of a new class of 'orchestration services' capable of composing services in the EOSC Exchange, hence across disciplinary borders, in order to provide new and advanced functionalities.

3.5.3 List of KER5 Individual Project Results

- EOSC IF Registry (including guidelines)

3.5.4 KER5 Key Opportunities

The opportunity lies in the fact that the EOSC IF can and will help to drive the adoption of open standards and promote the use of open data, which in turn will help to unlock the full potential of the EOSC. This is key and further supported by the fact that no specific IPR issues are foreseen for further exploitation of the EOSC IF. The operation of the EOSC Core and parts of the EOSC Exchange from 2024-26 by the winning bidder(s) from the EC procurement is expected to contribute to the EOSC Interoperability Framework in the coming years, as are numerous other EOSC-related projects including the EOSC Beyond project awarded as a result of the HORIZON-INFRA-2023-EOSC-01-04 call, which will develop the overall infrastructure of the EOSC IF

---

[14] For a description of the ERA policy agenda and the specific actions, see: https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/european-research-area_en

[15] See: https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&do=groupDetail.groupDetail&groupID=3477&news=1

[16] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018H0790

3.6 KER6: EOSC Knowledge Hub

3.6.1 Description

Seamlessly integrated with the EOSC Portal, the EOSC Knowledge Hub (KH) is a platform that delivers a highly curated learning Resources Catalogue and a state-of-the-art Learning Management System (LMS) with a Content Delivery and Authoring tool[17]. The catalogue focuses on free (as well as paid-for, where applicable) learning content pertinent to EOSC, its services and related FAIR and Open Science concepts. By bringing together disparate sources of information, the KH acts as a centralised hub for learning related to all things EOSC. A learning material metadata schema (based on RDA ETHRD-IG[18] materials, refined within EOSC Future project) has been produced, with wider applicability.

Through the creation of modularised CC-BY licensed training resources and promotion of reuse of those resources, the KH delivers tailored content to its users.

3.6.2 Unique Value Proposition

The KH is a centralised resource for learning about 'all things EOSC'.

- **Motivation**: The need for the KH arises with the aim to bring together disparate and scattered learning materials related to EOSC.

- **Key impact and benefits**: Highly curated content focussed on EOSC and related FAIR and Open Science concepts. Modular approach enables delivery of content tailored to users' needs. Delivers easy findability and use of EOSC-related learning with a centralised, modular approach using a standardised metadata set. Supports EOSC by providing access to the knowledge necessary for its use.

3.6.3 List of KER6 Individual Project Results

- Knowledge Hub Components

It is noted that the project results of the Knowledge Hub were consolidated into a single one. As the Learning Management System and the Authoring Tools are both off-the-shelf software which can be easily replaced by an alternative, they are not considered as project results. Therefore, these two project results were dropped and the 'Knowledge Hub Training Catalogue' was expanded to include the individual trainings developed by the project and was renamed as the 'Knowledge Hub Components'.

3.6.4 KER6 Key Opportunities

All in all, a vibrant and rich KH should promote the uptake of EOSC by reducing the barriers to adoption of EOSC resources by users, and in this sense, it has a crucial role to play. The EOSC Knowledge Hub can do this by providing information, resources, and support that can help to raise awareness, build capacity, and foster collaboration across the EOSC community.

3.7 KER7: Commercial Services and Support

3.7.1 Description

The project has committed to involving and supporting industry (especially SMEs) and integrating commercial services in EOSC to improve the exploitation of research products. The project is building on the work done in the OCRE project, which developed a procurement framework and agreements with research-relevant service providers to deliver commercial cloud services for storage, compute, and networking to researchers under favourable terms and conditions.

---

[17] The project has chosen Moodle and Articulate for Content Delivery and for Authoring respectively. However, these components can be replaced with other alternatives available in the market.

[18] Research Data Alliance Education and Training on Handling of Research Data Interest Group, see https://www.rd-alliance.org/group/education-and-training-handling-research-data-ig/wiki/ethrd-ig-focus-group-materials.

The purpose of the EOSC Digital Innovation Hub (DIH) is to serve as a contact point to engage SMEs and support them in offering services through EOSC, while the project acts as a contact point (through GÉANT) for large commercial providers.

3.7.2 Unique Value Proposition

- **Motivation:** [For the procurement mechanism] Setting up a practical and sustainable approach to establish and maintain a portfolio of procurement-compliant agreements with commercial services and identifying mechanisms by which related commercial services may be distributed via EOSC marketplace. Provided they have the budget to pay the bill, a researcher can use any service from this portfolio without further (administrative) fuss; [For the EOSC DIH] Creating a mechanism which supports the exploitation and use of EOSC resources by the private sector.

- **Key impact and benefits:** The EOSC DIH supports the commercial exploitation of research outputs and promotes innovation and digitisation of SMEs. It also creates additional market opportunities for innovative services. The procurement mechanism on the other hand enables access to procurement-compliant agreements with research-relevant commercial services for all researchers in the EOSC community.

3.7.3 List of KER7 Individual Project Results

- A tested framework for establishing, maintaining and distributing a portfolio of procurement-compliant agreements with research-relevant commercial services and data providers, with showcases.
- EOSC DIH.

3.7.4 KER7 Key Opportunities

The biggest opportunity arising from this KER is utilising the framework for establishing agreements with commercial service (and data!) providers and the DIH not just as an exploitation channel for EOSC resources by the private sector, but also as a channel for enriching EOSC through the inclusion of the services developed and under development by the private sector. As a well-established system, the DIH specifically can play an important role in the next phase of EOSC expansion as it targets the public and private sector as defined in the SRIA. Sustaining it is thus a matter of common sense, because if it is left to wither it will only have to be re-created in the future to support widening of the user base.

3.8 KER8: EOSC Future Community

3.8.1 Description

The EOSC Future Community KER captures the value generated during the course of the EOSC Future project by the collaboration and community-building aspects of the wide variety of technical developments, consultations, forums and other project events and activities which, taken together, form the EOSC Future Community. The KER identifies and documents the community-forming aspects of the activities, recording the value created and making it available for future use by other projects, organisations or initiatives.

The EOSC Future Community KER is focused on the importance of community formation for the development of the EOSC. It also highlights the value generated by collaborations taking place within the project.

3.8.2 Unique Value Proposition

Avoid the duplication of effort and ensure a coherent approach to EOSC community engagement and development.

- **Motivation**: Projects often start from scratch when it comes to EOSC Engagement. So, there is a need to facilitate continuous and coherent communication with all stakeholders. This is also to ensure dissemination and uptake of EOSC Future results and increase awareness of them.

- **Key impact and benefits**: The EOSC Future Community captures the value created from collaboration and community-forming activities; documents it in a coherent manner; increases awareness and avoids duplication of effort by making the information available to future initiatives.

3.8.3 List of KER8 Individual Project Results
- Community Database
- Collaboration Agreements
- Documentation

3.8.4 KER8 Key Opportunities

Historically, most EOSC projects have started from scratch when it comes to engagement with the EOSC stakeholders. It was envisaged that database developed by EOSC Future, along with its recommendations, would ensure that there was information available about an already-engaged user base for collecting feedback on future EOSC services. It was hoped that future EOSC projects and the procurement contractors would continue to develop this database, which ideally should be managed centrally to ensure that there is continuous and coherent communication with all the EOSC stakeholders.

4 Requirements and Challenges

4.1 Requirements

Requirements relating to exploitation are imposed on the project by the initial call text (INFRAEOSC-03-2020) and reflected in the Grant Agreement and Consortium Agreement. The model contract for the procurement presents specific requirements for the project to address. These were elaborated in further detail by the M24 EC review report.

The procurement contract regulates the rights over the results of the EC procurement and the background that is brought to the procurement, which are evolutions of outputs from the EOSC Future project. Many project results will be included in the procurement. In summary, the procurement contract sets out that:

(i)   The contractor brings the procurement background to the procurement project and builds on this. It must warrant that this procurement background and all other background materials in the project are free of claims and all the necessary rights have been obtained or licenced. To this end, the contractor is required to deliver detailed documentation on the procurement results and on all background materials incorporated in them.

(ii) The EU acquires all IP rights over the procurement results such that the EC can carry out or licence to third parties a range of exploitation actions.

(iii) The contractor therefore licences to the EC the rights on the procurement background materials included in the procurement results so as to enable point (ii) – the EOSC Future results licences must enable this.

The M24 EC review report requires, in summary:

- A shift in the project's implementation and exploitation strategy, involving: *Knowledge Harnessing and documentation that could enable and facilitate usage of the project's results by any entity in an Open Source and Open Access manner. EOSC stakeholders and the open-source community must be able to (re)use EOSC Future results based on open source and open access schemes.*

- Preparation of 'hand-over' of the results to the EC and exploitation by third parties, including generating a comprehensive, concrete and consistent documentation of the Project Results within each KER. The documentation shall include, for each KER and its results:
  - o The type of result
  - o The licensing scheme (CC, open source)

    o   The owner of the IP on the results, including information on the IP sharing agreements in case of joint ownership

    o   The long-term support level and end-of-life, if applicable

    o   Where the result can be found or downloaded

- Exploitation and sustainability plans for all KERs

- Taking effort to improve the exploitability of the results.

4.2   General Challenges

The requirements above are specific and quite demanding. The main challenges relating to the IP work are:

- The scale and scope of EOSC Future mean the job of collecting the required information is very substantial.

- There is a lack of knowledge and expertise amongst project participants about the specialised area of intellectual property, making it difficult and slow to gather the required information. This is perhaps the biggest challenge facing the Innovation and Exploitation Task in the project.

- Many of the results are jointly owned.

- The project has committed to providing open-source results. Work to ensure the copyright and licences assigned to the results supports this, but the handover and usability of the IP results, particularly for the software components destined for exploitation in the EC procurement, also needs to be addressed. This concerns where and how the results' IP-related information is provided and how it is managed and maintained in future.

4.3   Trademarking

In addition to the IP work, the project also needs to attend to trademarking. The EOSC Association has registered the trademark 'EOSC' in the relevant classes, in the EU. Project results which make use of the 'EOSC' mark (name or logo) will require agreement with the Association on trademark use and compliance with their branding guidelines. This will apply, for example, to the EOSC Observatory, the EOSC Knowledge Hub and numerous components in KER1.

4.4   Issues Specific to Individual KERs

The challenges described in section 4.2 above apply to the IP work in general. Issues specific to individual KERs – several of them relating to exploitation paths – also need to be addressed and are described briefly below.

4.4.1   KER2 EOSC Exchange

A challenge for the EOSC Exchange is that, by comparison with exposing an open-source resource in, say, GitHub[19], resource owners may be deterred from EOSC by the sense of responsibility implied by the requirements around EOSC onboarding. This issue may need to be addressed in future by a combination of 'carrot and stick': the gradually-building momentum of EOSC as a platform, or Data Space[20], for research and the enhancement it can provide to the findability of a resource (carrot), and funding policy requirements (stick). Similar to the learning curve in progress within EOSC Future itself however, this change of approach – defining ownership, licensing, sustainability etc more clearly – may be a necessary change of culture for the research community.

---

[19] https://github.com/

[20] EOSC is positioned by the EC as the science research and innovation data space – see https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en, accessed 20 April 2023

4.4.2   KER3 Science Projects

Establishing which outputs of the Science Projects are exploitable IP results from the point of view of EOSC Future has been challenging. The majority of the Science Projects have made use of datasets and other resources owned by individual Science Project partners, and have produced new, combined datasets and updated or new algorithms and workflows as a result of their work. The activities and outputs of the Science Projects are highly valuable for EOSC Future, for the evidence they provide of the value of EOSC for supporting cross-disciplinary research. The legal advice received however is that datasets, algorithms, workflows etc contributed, created and managed in the EOSC Future Science Projects are not a project result in IP terms ('IP Results'), to be exploited as an EOSC Future project IP result. They are scientific results, but do not generate EOSC Future project IP.

For the ownership, licensing and governance of new derived datasets, or new or updated workflows or algorithms, created within the EOSC Future Science Projects (ownership/joint ownership, outbound licensing, privacy compliance, etc.), the ultimate decision regarding their licensing lies with those organisations that are owners of any rights in the contributed data, algorithms etc. Clarifying ownership and governance and applying clear licencing would provide greater legal certainty about using these datasets in future but is outside the scope of the EOSC Future project.

From the point of view of exploitation of EOSC Future results, it is the *dissemination* artefacts of the Science Projects which are of interest, and hence represent project IP results.

4.4.3   KER4 EOSC Observatory

One of the challenges for the future of the EOSC Observatory is the alignment of monitoring activities and surveys and data collection related to EOSC and Open Science by key actors in the EOSC ecosystem. This includes alignment between the EOSC Steering Board, EOSC Association, and European Commission as well as with other stakeholders including expert groups and national coordinators on EOSC and Open Science and possibly the European Data Spaces. Progress continues to be made in addressing these issues.

4.4.4   KER6 EOSC Knowledge Hub

In terms of exploitation, the Knowledge Hub Training Catalogue is understood to form part of Lot 1 of the EC EOSC procurement; the Learning Management System and Authoring Tool are, in EOSC Future, both off-the-shelf components. Solutions for the latter two components would both need to be provided in future to support exploitation of the Training Catalogue.

Sustainability of the Training Catalogue will need to address the important issue of ensuring the information and resources the Knowledge Hub provides are kept relevant and up to date, which requires significant effort and therefore a certain level of expense. This goes along with curation of the materials, even the non-time-bound ones, to ensure that minimum standards of quality are met with respect to training.

4.4.5   KER7 Commercial Services and Support

The framework for establishing, maintaining, and distributing procurement-compliant agreements with research-relevant commercial services (and data providers) builds on the results of the OCRE project and makes services from multiple commercial service providers available under favourable terms and conditions to all EOSC users by exploiting cross-border joint pan-European procurement with 40+ countries. However, a good mechanism to assess sufficient (across thousands of institutions) demand for particular types of commercial services other than generic infrastructure-cloud has hitherto proven to be elusive. As there is significant cost associated with a joint procurement exercise spanning 40+ countries this is currently the biggest challenge. The current EOSC portfolio of agreements contains the OCRE agreements, the sustainability of which has been picked up by GÉANT. Any effort to expand the portfolio of agreements is as yet not funded and hence not sustained.

In terms of the EOSC DIH, the biggest challenge lies in its long-term sustainability. The EOSC Beyond project will support some continued EOSC DIH activities after the end of EOSC Future. The EOSC DIH has been working towards redefining its value proposition, identifying its long-term operational models and other revenue models

that can be adopted. It has also worked towards making its activities leaner and identifying improvements for its processes, with a view to improving its long-term sustainability prospects.

4.4.6   KER8 EOSC Community

The results emerging from the project are continuously monitored to assess their exploitability. It is natural that some new results are added, or old results are dropped or redefined, as the project progresses. After many internal discussions and after consultation with the IP lawyers, it was determined that the exploitation potential of KER8 was far lower than anticipated, especially due to complications due to GDPR and privacy concerns. Therefore, the project has decided to drop KER8 from its portfolio of KERs. To derive benefit from the information gathered however, at the end of the EOSC Future project a final message will be sent to the EOSC Future community communicating the end of the project and inviting them to subscribe to the EOSC Association newsletter, as the central place where they will be able to find all the most recent information around EOSC.

5   Ongoing Work

5.1   Overall Management

To ensure the opportunities available to the EOSC Future KERs are able to be fully exploited, and to address the requirements and challenges described in the previous chapter, the project has taken the following steps:

- Retained specialist IP lawyers to advise and guide the IP-related work;

- Updated the templates in use to collect IP-related information, in response to the M24 EC Review Report:

  o   See details in Appendix A. As can be seen, the templates include the type of result, its licencing scheme, the IP owners including joint ownership information and agreements, a URL providing access to the result, and exploitation and sustainability plans;

  o   Links to documentation and long-term support information, also stipulated in the M24 EC Review Report, will also be provided, to support results' exploitation.

5.2   Contributions Required from Project Partners

Project partners who contribute to the project's exploitable results are being supported by Task 1.4 and the lawyers to take steps targeting publication and management of the results as open source or open content, enabling (a) general public access to the results and (b) a legal, technical and organisational infrastructure for future evolution of the result and sustainability:

- Have traceability of IPRs in their results' background, third party contributions and dependencies, and corresponding license compliance obligations.

- Have full traceability of IPRs in foreground.

- Have clear ownership rules for IP for each project result and evidence of its management (mainly, through a Joint Ownership Agreement, for joint results, including determining the percentage of ownership of each owner; authority to defend IPRs; originality of the partners' contributions; initial licensing and repository; governance for IP and technical management of the result; information required for identification and publication of results).

- Have clear licensing of foreground for (a) general exploitation and (b) input into the Procurement. According to contract, this must be on an open basis.

- Provide documentation to enable and facilitate the usage of project results by any entity in an open manner.

- Ensure correct publication and hand-over of the results to the EC.

eoscfuture.eu

5.3 Coordination Work

Ongoing work in T1.4, to address the requirements and challenges indicated above, includes coordination of the following tasks:

- Continued IP and related information gathering for project results:
  - The number of individual project results has been reduced, simplifying the information gathering and licencing processes;
  - Preparation of an inventory of project results IP information including background and dependencies, for use for rights clearance and updating Attachment 1 to the Consortium Agreement;

- Clearance of inbound and outbound licencing and ownership information for the project results (due diligence):
  - To ensure the project meets its open source commitments, including full traceability of background IP and decisions on outbound licences (the licence on the foreground) which are compatible with inbound licences (the licences on the background and contributing IP)

- Updating Attachment 1 to the Consortium Agreement to accurately reflect all background IP to be protected;

- Discussion in the EOSC Future General Assembly of an overall project approach to IP in support of longer-term exploitation, evolution and maintenance of the results from an IP perspective;

- Drafting, conclusion and signature of Joint Ownership Agreements (JOAs) for the jointly owned results:
  - The number of JOAs is influenced by the overall approach to IP;

- Availability and presentation of the results in a manner and location which supports the project's open source commitments and exploitation plan;

- Communication with the EOSC Association on use of the EOSC trademark.

5.4 Delivery of IP Information to the European Commission

The most significant opportunity for EOSC Future, in terms of exploitation, is contributing to the further development of EOSC, through the use of many of the results in KERs 1, 2, 5 and 6, in the EC procurement. Exploitation of the results in the other KERs will also enhance the value and functionality of EOSC in important ways. The main expected exploitation paths for the KERs are currently as shown in Table 5-1 below, but as discussed in section 4.4, several exploitation issues are still being addressed. Exploitation and sustainability plans are in preparation for each result, which may include other exploitation opportunities and sustainability paths than those listed below.

The exploitation opportunities – notably the EC procurement – require that a complete set of relevant IP and related information is made available by the project to the EC in a timely manner. The information to be handed over includes the completed template (see Appendix A) for each result, in Word/PDF format, accompanied by relevant information in Github.

Table 5-1 below summarises some of the main exploitation paths identified for the EOSC Future results and indicates how and when the documentary information will be provided to the EC; the GitHub repository will be made available in parallel; table 4.2 summarises the timing per-KER.

Table 5-1: Major Exploitation Paths Foreseen for EOSC Future Results

Main Exploitation Path	KERs of Relevance	IP Information to EC At Latest By (Estimate)	Where and When Required Information Will Be Reported to EC
Procurement	1 (EOSC Core and Support 2 (EOSC Exchange) 5 (EOSC Interop Framework)	Late October 2023	Dedicated standalone report for procurement results, by end of October

	6 (EOSC Knowledge Hub)		2023 (and included in M30 periodic report, Nov 2023)
Dedicated EOSC Observatory project	4 (EOSC Observatory)	December 2023	M30 periodic report, November 2023
EOSC Beyond project	Some results from KERs 1 (Core and Support), 5 (Interop Framework), 7 (EOSC DIH)	End of March 2024	D1.3c, March 2024
OSCARs project	KER3 (Science Projects)	December 2023	M30 periodic report, Nov 2023
General availability/Open Source	All	End of March 2024	D1.3c, March 2024

Table 5-2: Timetable for provision of IP and Exploitation information per KER

KER#	KER Title	IP Information to EC At Latest By (Estimate)	Where and When Required Information Will Be Reported to EC
1	EOSC Core and Support	Late October 2023 (for results in EC procurement) End of March 2024 (for remainder of results)	Dedicated standalone report for procurement results, by end of October 2023 (and M30 periodic report, November 2023) D1.3c, March 2024
2	EOSC Exchange	Late October 2023	Dedicated standalone report for procurement results, by end of October 2023 (and M30 periodic report, November 2023)
3	EOSC Science Projects	December 2023	M30 periodic report, November 2023
4	EOSC Observatory	December 2023	M30 period report, November 2023
5	EOSC Interoperability Framework	Late October 2023	Dedicated standalone report for procurement results, by end of October 2023 (and M30 periodic report, November 2023)
6	EOSC Knowledge Hub	Late October 2023	Dedicated standalone report for procurement results, by end of October 2023 (and M30 periodic report, November 2023)
7	Commercial Services and Support	End of March 2024	D1.3c, March 2024

6 Conclusion

EOSC Future is a project; it is not 'the EOSC', but it generates a defined and agreed set of outputs on the path to creating the EOSC as an operational infrastructure. The EOSC Future Key Exploitable Results are key assets for EOSC, delivered in a short space of time and despite the handicaps imposed by the Covid pandemic, by a joint collaboration between the research clusters and the European e-Infrastructures, which draws heavily on scarce and valuable expertise.

This human collaboration is crucial for developing fit-for-purpose EOSC components and for integrating research resources with them to create new ways of doing science, demonstrating the additional value EOSC can provide to researchers compared to what they already have available to them. Its value should be recognised, and steps taken to ensure that the research clusters and the European e-Infrastructures can continue to collaborate in the future.

Appendix A – Project Result Template

1. Description

Name	<Name of the Project Result>
Description	<Describe the result in brief>
URL	<URL(s) to the result. Important: the URL(s) listed here must provide access to the result. For instance, in the case of software, the URL to the code repository. For Free and Open-Source Software, the link should be publicly available; for other results the URL can be on a private/internal page but access would need to be provided as part of the exploitation plan.>
WPs and Tasks involved	<List all the Work Packages including Tasks involved in generating the result>
Result Type	<Select one of the following > - Software - Training - Method - Service - Policy-related results - Documentation/Blueprint - Scientific or Technological R&D results - Other results (including hardware)
Result Contact Person	<Contact information of the primary contact person for the result>
Documentation	<Provide links to the documentation required to build, configure, operate and maintain the results>

2. Impact and Innovation

<For results which have a separate lifecycle to the KER to which they belong, please specify below details of sustainability and exploitation plans>

Innovation	<Describe what is new in the result. How it benefits the users and society in general>
Sustainability Plan	<Taking into account the open licensing of the results, briefly describe activities which ensure that results can be used after the end of the project. Consider aspects such as: - having clear ownership (legal or IP rights over the result) - access (availability and accessibility of the result to relevant stakeholders); - maintenance and support (activities preserving the functionality, reliability, usability of the result); - costs (sustainable funding models to cover expenses); - expected returns (benefits or value that stakeholders anticipate deriving from the result). >
ploitation Plan	<Exploitation is the use of results in further research and innovation activities other than those covered by the project concerned. Taking into account the open licensing of the results, think about both abstract and concrete aspects. Abstract (what can be done, potential exploitations): - Can the result be used for further research? - Can a new product or service be developed from it? - Can it be used for policy development? - Can it support standardisation activities? Concrete actions you are planning for potential user groups (some parts may be similar to Sustainability information above). Consider different time periods: +1 year, +4 years. For each group describe, • what is the exploitation/use objective for them? (eg use for further research, use for policy support, etc)?

	• What are the main messages you want to deliver? • What channels will you use to deliver messages? • How will the target group (when they hear your message and want to use the result(s)) access and use the results, and under what terms (i.e. who do they approach, where is the result located, etc)?>
Supporting Analysis	<Provide information to support your sustainability and exploitation strategies/plans. For example, brief SWOT and/or PEST analyses, including risk assessment for exploitation.>
Geographical Market	<Describe the local or global geographical regions for which the result has been developed primarily>

3. **IPR Information**

Are there IPR issues that will limit foreseen use?	

IP Back ground	<Please list all IP components **related to the result** brought by the partners into the project. This might be reports, software code, etc. There may be several IP components for each result. Don't forget know-how – which may be delivered as training or consultancy to support use. Additional column Underlying Open-Source Components: use this column to list any underlying open-source components which form part of the listed IP components: include each component's name and version, its Open-Source licence and a link to the component's code. If you need to list several Open-Source components, they can be captured in a separate document (include the url in this table). If results are jointly owned, link joint ownership agreement in the table below.>

Name	Short Description and url	IP Owner(s)	Type of protection or licensing action used	Protection or licensing actions used	Underlying Open-Source Components <include each component's name and version, its Open- Source licence and a link to the component's code>

Third-party IPs	<Please list all IP third-party components for which IP is owned by organizations outside the project.>

Name	Short description and url	IP Owner(s)	Type of protection or licensing action used	Protection or licensing actions used	Underlying Open-Source Components <include each component's name and version, its Open-Source licence and a link to the component's code>

IP Side ground	<Please list all IP components which are relevant to the project but produced outside the project by any of the partners during the project's tenure (providing a summary of the components of this aggregate result)>

	Name	Short description and url	IP Owner(s)	Type of protection or licensing action used	Protection or licensing actions used

	<Please list all IP created during the project. Include all the IPs related to components of this result. In the IP Owner(s) column, for jointly owned results, include the ownership percentage of each partner, and the url of the joint ownership agreement. Additional column Underlying Open-Source Components: use this column to list any underlying open-source components which form part of the listed IP components: include each component's name and version, its Open-Source licence and a link to the component's code. If you need to list several Open-Source components, they can be captured in a separate document (include the url in this table).>
IP Fore ground	

Name	Short description and url	IP Owner (s)	Confidential Click on YES/NO	Foreseen embargo date	Type of protection or licensing action used	Protection or licensing used	Long-term support level <select one or more options> and end of life	Underlying Open-Source Components <include urls and licences>
			- Yes - No		- Patents - Trade marks - Registered designs - Utility models - Copyright - Others		- Supported - Best efforts - Security patches - Un supported - Other (please specify) Expected end of life <month/year>	