# D3.3 Sustainability Report

30/09/2025


## Abstract

This deliverable describes work undertaken to collect financial sustainability information about the EOSC Beyond services. It analyses the services in terms of their entrepreneurial or organisational approach, their technical or competitive approach, and also economic considerations applying to the services, and discusses the service providers' maturity based on knowledge of the organisations and the context in which they operate.



Funded by the European Union

EOSC Beyond receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101131875

# Document Description

| D3.3 Sustainability Report | | | |
|---|---|---|---|
| **WP13** | | | |
| **Due date** | 30/09/2025 | **Actual delivery date:** | 30/09/2025 |
| **Nature of document** | Report | **Dissemination level** | Public |
| **Document Status** | Under EC review | **Version** | 1.0 |
| **Lead Partner** | EGI Foundation | | |
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| **Approved by** | TCB | | |
| **Document link** | https://documents.egi.eu/document/4110 | | |
| **DOI** | https://https://zenodo.org/records/17231898 | | |
| **Keyword** | EOSC Beyond services, EOSC landscape, financial sustainability | | |

## Revision History

| Issue | Date | Description | Author/Reviewer |
|---|---|---|---|
| V 0.1 | 31/08/2025 | Draft version | Dale Robertson, Amanda Calatrava, Androniki Pavlidou |
| V 0.2 | 31/08/2025 | Revised version | Mark Dietrich |
| V 0.3 | 01/09/2025 | Revised version | Dale Robertson, Mark Dietrich, Amanda Calatrava, Androniki Pavlidou, Thanassis Mantes |
| V 0.41 | 04/09/2025 | Version for internal review | John Shepherdson, Katarzyna Lechowska |
| V 0.42 | 04/09/2025 | Version for review by participating service providers | Carlos Brandt, German Molto |
| V 0.5 | 18/09/2025 | Post-review version | Androniki Pavlidou, Mark Dietrich, Dale Robertson |
| **V 1.0** | **30/09/2025** | **Final** | |

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# Executive Summary

This deliverable describes work undertaken to collect financial sustainability information about the EOSC Beyond services, analysing their options for attracting or generating funding or income after the end of the EOSC Beyond project. It is an interim report, with a further deliverable due in March 2027. The work was conducted within a complex and constantly developing EOSC landscape.

Participation in the exercise was voluntary, and information was gathered for 11 of 18 possible EOSC Beyond services:

1. EOSC Front Office
2. EOSC Service Catalogue
3. EOSC Research Product Catalogue
4. EOSC Resource Discovery Hub (RDH - Search Service)
5. EOSC Explore
6. EOSC Monitoring
7. EOSC Accounting for Research Products
8. EOSC Helpdesk
9. EOSC Interoperability Framework Registry
10. EOSC Deployment Service
11. EOSC Data Transfer

Information was collected relating to the services' competition; expected possible exploitation paths and their likely costs; intellectual property rights; expected data controllers and processors; anticipated income or funding streams for each exploitation path. The information gathered produced the following **main insights**:

- Entrepreneurial/Organisational Approach: most of the service providers accepted the example exploitation paths (service creation, further research) suggested to them without offering additional options or ideas. Some are beginning to address modularity - packaging of services into clear products which customers can understand and use, and dependencies on other components. Few of the providers offered estimates for incremental service provision (what it costs to provide the same service to multiple clients) or demonstrated understanding of how competitive offerings might affect the provider's own cost structure, service viability or future sustainability. Many providers have not addressed in detail the issues - such as performance commitments expressed in SLAs etc, or legal liabilities including those related to processing of personal data - involved in providing their services on a more professional basis.
- Technical/Competitive Approach: market and business factors affect the sustainability prospects of the services, but in most cases have not been analysed in detail by providers. Some of the services have competition from commercially available alternatives; some have been developed specifically for EOSC. In recent years however the EOSC Beyond services have been developed specifically with EOSC in mind. Fully realising the value of the effort and expense this has entailed

implies deploying these services in EOSC in future. Many of the services are built from open source software components, and all have open licences. The risks and benefits entailed in these choices have, in general, not been assessed in detail in the EOSC community. The services' development costs have mostly been funded by EC research projects and so don't need to be recovered in future, potentially making the services cheaper than their possible commercial competitors.

- Economic Considerations: the 18 EOSC Beyond services may be considered as a set needed to implement an EOSC node. Total costs for operating all 18 services were derived from the information collected for the 11 services which participated in the exercise, as follows: one-time costs: 190k Euros; annual costs: 1.6M Euros (per year). These figures are comparable to the estimates made by Candidate Nodes themselves (see details in **Table 3**, **section 3.2.3**), although the one-time costs presented in this report are lower than the average estimate by EOSC Nodes, and annual costs in this report are slightly higher than the average estimate by EOSC Nodes. This suggests that:
    - Candidate Nodes are unaware of the services that could already be integrated into their Node infrastructures.
    - The EOSC Community itself should help existing EOSC service providers to package their proven services to allow for easier uptake by Candidate nodes.
    - Service providers should pay greater attention to their marginal costs, to economies of scale and to synergies with other services (including ones the provider itself offers) to make their services more affordable and attractive.

Based on this analysis, it may be suggested that service providers could improve their own understanding and awareness of their cost structures. Marginal costs and synergies should be explored more deeply, since it may lead the way to increased sustainability. There are also implicit opportunities for economic benefits where the EOSC Community leverages the investments that have already been made, by encouraging adoption of various EOSC services across the multiple "versions" of EOSC being implemented.

The data collected indicates that service providers have a good understanding of the costs associated with providing their services, as well as an understanding of the different exploitation pathways that might be appropriate for each service, but further discussion and refinement might yield better information that would allow for better estimates of costs in various scenarios.

The service providers are EOSC stakeholders with longstanding involvement in and commitment to the development of EOSC. They share a deep - and common - understanding of the requirements of the actual and potential EOSC user community, many of whom they collaborate with within EOSC Beyond and other projects in the development of their services. Based on the analysis, several opportunities exist for greater benefit to be derived from the EOSC Beyond services, for EOSC nodes and the wider EOSC user and stakeholder community, as well as for the service providers themselves.

# 1. Introduction

The activities of the EOSC Beyond project include improving existing EOSC Core services and fostering the uptake of the EOSC Core by the research community via a set of EOSC Pilot Nodes. Task 3.4 (EOSC Core Sustainability) is focussed on the financial sustainability of the next generation of EOSC Core and generic services, analysing their options for attracting or generating funding or income after the end of the EOSC Beyond project. This deliverable reports on the Task's work from April 2024 until September 2025, and it is likely to be of particular interest for the EOSC Partnership in addition to the service providers themselves. It is an interim report, with a further deliverable (D4.2 Sustainability Report Update) due in project month 36 (March 2027).

The EOSC Beyond project is being conducted during a significant inflection point in the evolution of the European Open Science Cloud, with rapid change along several dimensions:

**Organisational**. The wider EOSC landscape is evolving rapidly, transforming from one centred around a single "EOSC Core" infrastructure to a vision of EOSC as a federation of multiple EOSC Nodes serving the many research communities and e-Infrastructures operating across Europe. A selection process run by the EOSC Tripartite governance in summer 2024 for the first "wave" of EOSC candidate Nodes resulted in the selection in February 2025 of 13 **candidate Nodes**. In parallel, the first edition of the **EOSC Federation Handbook**, published in March 2025, was compiled from contributions by EOSC stakeholders, providing an overview of the organisation, operational structure and technical characteristics of the EOSC Federation. Meanwhile, **the EOSC EU Node**, created by a procurement run by the EC, was launched in October 2024 forming the first operational EOSC Node. The EU Node and the candidate Nodes will work together to co-develop the work plan of the EOSC Federation. EOSC Beyond and numerous other EOSC projects coordinate[1] and collaborate to bridge gaps[2], to contribute towards implementing EOSC. This growing number of "versions" of EOSC begs the questions, first, of their interoperability and, second, of how to construct those interoperable "versions" in the most sustainable way.

**Governance**: In its current implementation phase (2021-2030), EOSC is a **Co-Programmed European Partnership** operating within the context of Horizon Europe (2021-2027). The Partnership has a Tripartite governance consisting of the EC, the EOSC Association and the EOSC Steering Board in which the EU member states and associated countries are represented. The governance and funding model for EOSC after 2027 remains to be defined. Discussion within the Tripartite governance about this was suspended in March 2024 but restarted in February 2025 and is currently ongoing.

**Technical.** Best efforts solutions, developed in the context of research and innovation projects, need to evolve into proven components of a system able to reliably meet the growing and evolving needs of the research users who are expected to use EOSC every day. The services and components used in various "versions" of EOSC have been developed

[1] For example annual coordination meetings. See link
[2] See EOSC Opportunity Area Expert Groups and also Winter Schools (2024, 2025)

either specifically for use in EOSC or to fulfill more general requirements found in EOSC as well as in other cloud platforms. Some services have been developed originally from scratch and might now find themselves competing with similar offerings created by others – both within the academic market and in the cloud market more broadly. Other services build on open source solutions used in cloud systems outside of academia, customising for the needs of EOSC, while leveraging investments made by others to serve broader market needs. Ideally the European Open Science Cloud, as a whole, should make an informed "build or buy" decision about all the components and services it needs to fulfill its mandate, and separately each service provider needs a credible roadmap for consistently delivering the required capabilities. This dimension introduces the following factors that prospective EOSC service providers should reflect in their technical roadmaps:

- **Market Orientation/Competitive Awareness**: Roadmaps should reflect offerings from relevant competitors: what features are offered, with what terms and licensing, which competitors themselves have sustainable offerings by virtue of strong market positioning/adoption (vs. offers from new entrants that may not survive)
- **Modularity**: Roadmaps should also reflect packaging of features into appropriate modules, allowing EOSC customers to select packages that offer the right combinations of features, without requiring payment for capabilities they do not need.

**Entrepreneurial**. Given the direction of the EOSC Federation, existing EOSC service providers are now expected to evolve their own role from research partner to reliable service partner. These partners must now take on new business risks regarding future funding for EOSC and the viability of their own services in comparison with similar services being used elsewhere in the EOSC community, or being offered in the cloud ecosystem more broadly. Most of the different institutional providers of EOSC services have participated as beneficiaries in earlier funding calls to create and develop the services and components needed to deliver on the promise of the European Open Science Cloud. Some are now providers contracted by the European Commission to deliver the managed services that comprise the EOSC EU Node. These and other providers, in various combinations, are also providing their capabilities to one or more EOSC Nodes being implemented as part of the build-up of the EOSC Federation. This dimension introduces the following factors that prospective EOSC service providers should reflect in their economic approach:

- **Exploitation:** Which exploitation pathways are considered by the service provider – continued delivery as part of a research "project", delivery as a standalone service, or delivery as a standard service to multiple customers.
- **Marginal Cost Consideration**: Where a service can be delivered in a mostly standard way to multiple clients, how would the service be priced? To what extent can the provider implement a "business plan" that assumes that the incremental cost to deliver the service falls with a growing number of clients and that passes this benefit on to customers as a lower "average" cost for the service?

Despite this complex and constantly developing landscape, Task 3.4 members and other partners in the EOSC Beyond consortium have attempted to tackle the problem of sustainability in a pragmatic way, gathering specific information about the markets within which they provide their services, the costs of service deployment, and the ways they expect

their services will most likely be exploited in future. This pragmatic analysis should be useful not only for the service providers but also as input in the ongoing consideration of the post-2027 EOSC model, and the commentary provided has been written with this in mind.

In this deliverable, the methodology adopted for the work is described in chapter 2, the findings are presented and analysed in chapter 3, and conclusions are presented in chapter 4.

# 2. Methodology

## 2.1. Methodology Development

The T3.4 team, which included representatives of several service providers within the EOSC Beyond consortium, concluded that T3.4 could best support the service providers by working with them to gather and analyse information relating to the possible future exploitation options available for their services after the end of the project.

The team drew on a range of information sources and experiences in the process of developing its approach. These included:

- The work on service exploitation and sustainability performed in the OpenAIRE Nexus project. OpenAIRE conducted a detailed analysis of the value propositions, potential customers, costs and possible revenues of their suite of services[3],
- The intellectual property identification and cataloguing performed in the EOSC Future project[4], which included many of the services being further developed in EOSC Beyond,
- Consideration of resourcing models in EOSC Focus **deliverable D5.1**,
- The **Sustainable Exploitation Pathways methodology** developed within the EOSC Focus project,
- The interTwin project's **webinar on exploitation and sustainability**,
- The ERIC Forum **proposed model sustainability plan for ERICs**,
- A **Lean Canvas** questionnaire used in the SoBigData project[5].

A template was developed for use in EOSC Beyond (see **Appendix C**), which included space to gather the following information about each service:

- Service competition: alternative solutions available from other providers,
- Expected possible exploitation paths and their likely costs, broken down into cost components,
- The intellectual property rights assigned to the service and/or its components,
- The expected data controllers and processors for each exploitation path,
- Anticipated income or funding streams for each exploitation path.

The data protection section of the template was included in response to awareness of the complexity of defining data controllers and processors for services in the context of the EOSC Federation. Service providers were thus encouraged to consider this aspect for the different exploitation paths of their services.

## 2.2. Information Collection Process

The information required to complete the template needed to be gathered from the EOSC Beyond service providers. To engage them in the process, short presentations were made at

[3] The public part of this work can be seen in the form of the OpenAIRE product portfolio starting from https://catalogue.openaire.eu/home
[4] Selected EOSC Future IP information can be accessed at this link
[5] The questionnaire is not publicly available, so not shared here.

two EOSC Beyond Technical Coordination Board meetings, in December 2024 and July 2025, and also at a WP7 meeting in January 2025. A very short survey was also deployed in connection with the presentations, for service providers to indicate whether they wished to engage with the process of analysing their services' sustainability. Participation by the service providers was voluntary: they were free to choose whether they wished to take part in the exercise or not. The survey responses are presented in **Appendix B**. The survey served well to engage the service providers, showing that they were keen to participate in the sustainability work.

Information gathering then proceeded with individual service providers, in an iterative manner to complete the template for each service. The starting point for the services to be analysed was the Service Portfolio listings in the Service Management System for EOSC Beyond (see **Table 1**):

| Service Portfolio entry title | Leading provider(s) | Status in EOSC Beyond Service Portfolio | Service Name in this report |
|---|---|---|---|
| SP PROVIDE as-a-service for EOSC Nodes | OpenAIRE | Prototype available | N/A |
| SP EOSC Community AAI | GÉANT | Operational | N/A |
| SP EOSC Infrastructure Proxy | GRNET | Operational | N/A |
| SP Service Catalogue | ATHENA RC | Operational | EOSC Service Catalogue |
| SP Interoperability Framework Registry | ATHENA RC | Operational | EOSC Interoperability Framework Registry |
| SP Research Product Catalogue | OpenAIRE | Operational | EOSC Research Product Catalogue |
| SP Data Transfer | EGI Foundation | Operational | EOSC Data Transfer |
| SP Integration Suite | EGI/ARC | Pre-production deployment (end of September 2025) | N/A |
| SP Discovery Hub | ACC Cyfronet AGH | Operational | EOSC Resource Discovery Hub (RDH) |
| SP Marketplace | ACC Cyfronet AGH | Operational | EOSC Front Office |
| SP EOSC Explore Service | OpenAIRE | Operational | EOSC Explore |
| SP: Order Management System | ACC Cyfronet AGH | Not in operation | N/A |
| SP Helpdesk | KIT through EGI Foundation Service Catalogue | Operational | EOSC Helpdesk |

| Service Portfolio entry title | Leading provider(s) | Status in EOSC Beyond Service Portfolio | Service Name in this report |
|---|---|---|---|
| SP User Dashboard | ACC Cyfronet AGH | Operational: component of EOSC Beyond Resource Discovery Hub | N/A |
| SP PID Service | GRNET | Operational | N/A |
| SP Accounting for Services | GRNET | Operational | N/A |
| SP Accounting for Research Products | OpenAIRE | Operational | Accounting for Research Products |
| EOSC Federated AAI Connector | GÉANT | Operational | N/A |
| SP Deployment Service | UPV | Operational | EOSC Deployment Service |
| SP Monitoring | GRNET | Operational | EOSC Monitoring |
| SP Messaging | GRNET | Operational | N/A |

*Table 1 - Selected information from the service listings in the EOSC Beyond service management system*

Of the 21 services listed in the EOSC Beyond Service Portfolio, 2 are not yet in operation, and 1 has been merged with another service, leaving 18 services of potential interest. Of these, information was gathered for the following 11 services:

1. EOSC Front Office
2. EOSC Service Catalogue
3. EOSC Research Product Catalogue
4. EOSC Resource Discovery Hub (RDH - Search Service)
5. EOSC Explore
6. EOSC Monitoring
7. EOSC Accounting for Research Products
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The results of the data collection therefore represent 61% of the operational services of EOSC Beyond, including services with a range of complexity and scope. The analysis of the data collected therefore supports conclusions that should be relevant to all of EOSC Beyond, and therefore also to the EOSC EU Node and other EOSC Nodes that may be established in the coming months and years.

The information collected is summarised in **Appendix A**, but as some of it, in particular about costs and possible incomes, is sensitive, the full information is not included in this deliverable.

An interactive session also took place at the EGI Conference in June 2025, in which a live survey was conducted with the audience to collect their input in relation to the services (see details in **Appendix D**).

The findings from the work are reported in **chapter 3**.

# 3. Findings and Analysis

This chapter discusses and analyses the information gathered from the service providers.

## 3.1. Summary of Sustainability Characteristics for each Service

This section summarises the information gathered for each service. Due to the sensitive nature of some of the information - most obviously the cost and income data - the full details are not reported here but they are nonetheless drawn on in the analysis in section 3.2.

| Service | Exploitation/Modularity | Marginal Cost Consideration | Market Orientation/Competitive Awareness | Service Creation | | Further Research | |
|---|---|---|---|---|---|---|---|
| | | | | One-time Cost Range | Annual Cost Range | One-time Cost Range | Annual cost range |
| EOSC Service Catalogue | Service/Research | No | Limited | none | Less than €50k | €25k-€50k | €150k-€200k |
| EOSC Interoperability Framework Registry | Service/Research | No | Limited | none | Less than €50k | none | €150k-€200k |
| EOSC Research Product Catalogue | Service/Research | No | Limited | none | €100k-€150k | none | €100k-€150k |
| EOSC Data Transfer | Service/Research | No | Some | €25k-€50k | €50k-100k | N/A | N/A |
| EOSC Resource Discovery Hub (RDH) | Service/Research | Some | Some | €25k-€50k | €200k-€250k | €100k-€150k | €100k-€150k |
| EOSC Front Office | Service/Research | Some | Some | €25k-€50k | €200k-€250k | €100k-€150k | €100k-€150k |
| EOSC Explore | Research | No | Some | N/A | N/A | none | €100k-€150k |
| EOSC Helpdesk | Service/Modular | Yes | Good | Less than €25k | Less than €50k | N/A | N/A |
| EOSC Deployment Service | Service/Research | Preliminary | Good | none | €50k-100k | none | €50k-100k |
| EOSC Monitoring | Service | No | Some | €25k-€50k | €200k-€250k | N/A | N/A |
| EOSC Accounting for Research Products | Research | No | Limited | N/A | N/A | none | €100k-€150k |

*Table 2 - EOSC Beyond services which participated in the sustainability information gathering process*

## 3.2. Analysis of/Commentary on Findings

In this section, a commentary is provided based on observations from analysis of the information gathered about the services listed in table 2.

### 3.2.1. Entrepreneurial/Organisational Approach

Existing providers displayed a range of approaches from an entrepreneurial and organisational perspective:

- Most service providers proposed the same two exploitation paths (namely, “service creation”, and “further research”) without offering additional options or ideas. Understanding of costs and income was aligned to this framework, with limited consideration of service/product modularity or incremental costs. A few did not even consider the “service creation” exploitation path, positioning themselves as research partners only.
- A few service providers were beginning to address the modularity of their services – packaging of services into clear products that can be explained to customers, and which customers can understand and use, as well as dependencies on other components.
- Few of the providers offered specific estimates for incremental service provision (i.e. what does it cost to provide the exact same service to multiple clients). This requires differentiating initial development and recurring maintenance costs. Both types of costs can also be divided into “fixed” costs that are borne even if there are no customers, and “incremental” or “marginal” costs that depend on the number and nature of customers, including initial customer setup, ongoing customer support and direct costs of serving that customer.
- While aware of competitive offerings, which in some cases were significant, few providers demonstrated understanding of how these competitive offerings might affect the provider’s own cost structure, service viability or future sustainability. Ideally the costs associated with those alternatives and how they reflect on possible competitive advantages for the service should be considered by providers. They should answer the following questions:
    - Does this service provide different capabilities?
    - Does it provide capabilities uniquely required by this market (i.e. the EOSC community, data spaces, European RIs more generally)?
    - If this service were not already available from this provider, would a similar, new service be created to meet this need, or would customers happily use one of the alternatives that are available?

This range of approaches suggests that further examination of this topic, with providers individually and in groups, would improve their awareness of entrepreneurial/organisational issues that each provider must address in order to better position their service(s) to be sustainable.

Another aspect of entrepreneurial/organisational issues that must be addressed is the readiness of each service provider to offer their service with performance commitments, rather than as a “best efforts” service of a research project.

- Is the provider - specifically the provider’s management - prepared to enter into legal agreements with customers for the service, to commit to performance measures (e.g. SLAs), etc?
- Has the provider considered legal liabilities that might be associated with provision of this service? In particular where the service handles or manipulates personal data, does the provider have a clear understanding of what personal data is touched by the provider, and how this is governed through designation of controller and/or processor and creation as appropriate of privacy policies and data processing agreements (as required by GDPR)?

The second point is touched on in the context of data protection requirements for the service. However most providers simplify this issue by seeking to act purely as a “data processor”, leaving questions of legal liability to the “data controller”.

### 3.2.2. Technical/Competitive Approach

The sustainability of a service is not purely a question of economics. It also depends on many other factors, including:

- demand for the service,
- how the service delivers value to the customer today (current features) and tomorrow (planned features, and “roadmap”),
- the technical risks associated with the service (does it depend on other services which may or may not be maintained or available in the future),
- the availability of alternatives (both commercial and open source).

This analysis has touched on some of these aspects, although further examination could be valuable in assessing the sustainability of EOSC services. Here are some general observations in this area:

- The survey conducted at the EGI conference reflected the interest from the research community in using the EOSC Beyond services in future, for supporting projects, service deployment, use cases, integration with scientific workflows and in connection with building nodes in the EOSC Federation (see more details in **Appendix D**)
- Some of the services have competition from commercially available alternatives that, in theory, could be deployed within EOSC in their place. There are also services developed specifically for EOSC and which, currently at least, are unique. Despite this, the EOSC Beyond services have been developed in recent years specifically with EOSC in mind, and realising the full value of the effort and expense put into that effort implies deploying these services in EOSC in future.
- The services and the individual components they consist of are all openly licensed. In theory this means they could be freely replicated and further developed by other providers, but in practice this rarely happens so is not considered a significant risk. Many of the service providers participated in the EOSC Future project, where the

compatibility of services' licences with third party components was verified. Such verification will take place again in EOSC Beyond for any further third-party software. It is possible, however, that some licences restrict exploitation to non-commercial use only, and this would need to be borne in mind when considering future exploitation pathways. More generally, when considering possible future exploitation options, it is important for service providers to adopt an appropriate IP protection strategy.

- Many of the services are built from open source software components. This is sometimes criticised for the risk it carries, that the components will cease to be supported or developed by their communities.
- The providers all envisage the possibility of further development of their services or components, usually in the context of EC- or nationally-funded research projects. This is in part a reflection of the nature of the service providing organisations, which are mostly universities or research institutes with a culture of depending on grant funding for their activities.
- The historical development costs of the services have mostly been funded by EC research projects and so don't need to be recovered in future, potentially making these services cheaper than their possible commercial competitors.

### 3.2.3. Economic Considerations

Aggregating the reported costs for the "service creation" exploitation pathway across the 10 services which provided detailed information, and then extrapolating the result to the full service portfolio of EOSC Beyond (inflating by 1.4), yields the following aggregate costs (one-time and annually) for the 18 services that might be needed to implement an EOSC Node:

- One time costs: 190k Euros
- Annual costs: 1.6M Euros (per year).

These figures are comparable to the estimates made by Candidate Nodes themselves (see table 3 below)[6], although these one-time costs presented here are lower than the average estimate by the EOSC Nodes (both for design and implementation individually as well as together), and annual costs are slightly higher than the average estimate.

| | Average | Min | Max |
|---|---|---|---|
| Design of a node | 0.83M | 0.25M | 2M |
| Implementing a node | 1.5M | 0.6M | 2.7M |
| Operating a node | 0.9M/year | 0.13M/year | 2.15M/year |
| Ongoing development/expansion of a node | 0.6M/year | 0.3M/year | 0.8M/year |
| Connecting a node to the EOSC Federation | TBD | TBD | TBD |

*Table 3 - Estimated average five-year cost of designing, implementing and operating an EOSC node*

[6] This table is on page 45 in Appendix 2 of Implementing the European Open Science Cloud (EOSC) in Ireland, https://doi.org/10.5281/zenodo.16266118. The table summarises initial budgetary estimates collected from the 13 candidate nodes in the current federation build-up group.

Subject to caveats listed below, this suggests:

- Candidate Nodes are unaware of the services that could already be integrated into their Node infrastructures, so they assume high design and initial development costs as well as optimistic (i.e. too low) operating costs.
- The EOSC Community itself should explore opportunities to improve economics for these Candidate Nodes by helping existing EOSC service providers package their existing, proven services to allow for easier uptake by those Candidate nodes.
- Service providers should give greater attention to their marginal costs, to exploit economies of scale (as recommended in feedback provided at the EGI conference - see **Appendix D**) as well as synergies with other services (including ones the provider itself offers) in order to make their services more affordable and attractive.

Service providers could improve their own understanding and awareness of their cost structures, in light of the organisational and technical considerations identified above. As noted, marginal costs and synergies should be explored more deeply, since it may lead the way to increased sustainability.

There are also implicit opportunities for economic benefits where the EOSC Community leverages the investments that have already been made, by encouraging adoption of various EOSC services across the multiple “versions” of EOSC being implemented. As a key stakeholder in EOSC, the EC can facilitate this in general, and specifically by supporting development and innovation that would benefit multiple EOSC “clients”.

# 4. Conclusions

The service providers are EOSC stakeholders with longstanding involvement in and commitment to the development of EOSC. They share a deep - and common - understanding of the requirements of the actual and potential EOSC user community, many of whom they collaborate with within EOSC Beyond and other projects in the development of their services. The analysis in the previous section characterises the maturity of each EOSC service provider from the perspective of offering services to the different "versions" of EOSC (e.g. EOSC EU Node, other EOSC Nodes, etc.) as well as research infrastructures and other infrastructures (e.g. data spaces) in general.

The primary exploitation pathways (service creation and further research) were suggested by the T3.4 team and were embraced by most service providers. Only a few service providers organised their economic information in a fully "modular" way, suggesting that further discussion and refinement might yield better information that would allow for better estimates of costs in various scenarios.

Similarly, providers assume that income for each capability would follow the same exploitation pathways, with either contractual payments for a specific service created for the client, or project-based income associated with further research involving the service itself. Few providers have given much consideration to the "market" for their service, namely the different entities that might wish to purchase that service, and the requirements associated with those implementations.

The data collected indicates that service providers have a good understanding of the costs associated with providing their services, as well as an understanding of the different exploitation pathways that might be appropriate for each service. At the same time, it would be valuable to further refine the information collected:

- Align the philosophies of different service providers so that sustainability information (e.g. cost projections) could be sensibly compared across different scenarios.
- Collect additional data on how each service might be provided to multiple clients (e.g. EOSC Nodes, data spaces, research infrastructures, etc) and the marginal/incremental costs associated with such arrangements.
- Consider opportunities to bundle services from different providers, or to package services from a single provider to take advantage of technical synergies (i.e. service X costs a certain amount on its own, but if purchased along with service Y, the additional cost is much lower).

Larger issues of entrepreneurial/organisational readiness, willingness to meet performance requirements, and clear consideration of legal issues and liabilities, particularly in connection with licensing and data protection, could be addressed in any follow-on investigations, along with the topics listed above.

# Appendix A - Summary of Information Collected for 11 Services

Information about service costs was provided as part of the data collected. As this information is sensitive however, the costs are provided below in ranges rather than as precise figures. The ranges used are:

- One-time costs
  - Less than €25k
  - €25k-€50k
  - €50k-100k
  - €100k-€150k.
- Annual costs
  - Less than €50k per annum (pa)
  - €50k-€100k pa
  - €100k-€150k pa
  - €150k-€200k pa
  - €200k-€250k pa.

## 1. EOSC Front Office

**Description**: Formerly known as the EOSC Marketplace, EOSC Front Office is a core service for EOSC Nodes, implementing federated service discovery, access, and re-use. Designed for communities unified at both operational and technical levels, it serves as the central entry point for accessing services, analytical tools, data management solutions, storage, and computing resources essential for research. This integrated platform simplifies access to a broad range of services across various research domains, offering data and comprehensive data analytics tools from local, national, and international providers, including major European e-Infrastructures and Research Infrastructures (RIs). EOSC Front Office can operate as an independent service or platform, serving as an aggregator of RI's and other service offerings, and providing users with direct access to them. It forms part of the EOSC user-facing services within EOSC Beyond, alongside the Resource Discovery Hub (which supports wide-ranging scientific resource discovery) and ReSearchConnect (a workspace and collaboration environment for users).
**Alternatives:** There are numerous marketplaces for cloud-based services, primarily infrastructure services (e.g. compute and storage), and typically optimised for specific cloud platforms (e.g. AWS, Azure, Apache Marketplace for Apache CloudStack), and increasingly AI- and HPC-focussed platforms (Paperspace and ReScale). There are fewer mature marketplaces for platform as a service (PaaS) or software as a service (SaaS) services – most are domain specific (e.g. marketing services) and generally operated as commercial activities themselves.
**Intellectual property:** Open-source software, in public repository, available for use under GNU GPL v3.0 licence.
**Components:** Standard Front Office Service (delivered as a service), standard open source code, underlying infrastructure, customization services, support services

**Main exploitation pathways:** 1a) Deploy customised version of service, on either customer infrastructure or Cyfronet infrastructure, 1b) Deploy standard version of service on customer's infrastructure, with Cyfronet providing SLA-based support services, 2) Project based deployment with research-driven innovation, as well as complementary training and outreach.

**Overview of costs and income (by exploitation path):**

- Service Creation, fully customised and supported: one time costs between €25k and €50k Euros, plus annual costs of €200k-€250k (pa).
- Further Research: one-time costs between €100k and €150k Euros, plus annual costs of €100k and €150k (pa).
- Income: Funding through participation in projects or procurement contracts.

**Treatment of personal data:** No personal data is stored.

## 2. EOSC Service Catalogue

**Description**: The EOSC Resource (Service) Catalogue provides data and functionality to register, maintain, administer, and share resources onboarded by various providers. It also serves as the point of reference for all EOSC Core components that add value to this information, making the data and services searchable and accessible through various tools for both researchers and end users.

**Alternatives:**

OpenAIRE Service Catalogue - **https://catalogue.openaire.eu/home**

OpenAIRE catalogue is focusing on presenting an overview of Open Science services and information about them. It focuses on OpenAIRE services. It doesn't provide functionalities as the EOSC Service Catalogue that is more like an umbrella service.

Open Science Catalog - **https://opensciencedata.esa.int/**

It is a catalog of publicly available geoscience products, datasets and resources developed in the frame of scientific research Projects funded by ESA EO (Earth Observation). Products vary in geographical and temporal extent, production methodology, validation and quality. It's a thematic catalogue that looks more like a repository presentation of information.

OPERAS - **https://operas-eu.org/services/**

OPERAS service catalogue is designed to evolve through new service ideas generated by the research community via collaborative projects and captured by the OPERAS Governance bodies, Special Interest Groups (SIGs), and the OPERAS Innovation Lab. Therefore is a catalogue that is bound with the organisation, with minimum mandatory information.

SSHOC Service Catalogue - **https://sshopencloud.eu/service-catalogue**

Between January 2019 and April 2022 SSHOC delivers a series of services and tools for daily use by SSH researchers. All tools will be made available via the SSH Open Marketplace by April 2022. It has a categorisation of services based on categories and data from project deliverables, not a holistic approach.

OSCARS - **https://oscars-project.eu/science-clusters-services**
The information is thematic and project based, including referrals to other thematic catalogues like ENVRI, SSHOC, LS RI.

**Intellectual property:** Open-source software, in public repository, available for use under GNU GPL v3.0 licence or Apache 2.0.
Foreground

- EOSC Beyond Interoperability Registry
- EOSC Beyond Service Registry
- EOSC Beyond Providers Portal

**Components:** The components of the service are:

- EOSC Beyond Service Registry

EOSC Service Catalogue offers the underlying storage functionality and the interoperability tools for the programmatic access, registration, manage (CRUD) of providers, services, and catalogues. It also offers the necessary API functionality for the interoperability of service catalogues from individual providers or aggregators (e.g., thematic, or regional catalogues) with the EOSC portal.

- EOSC Beyond Providers Portal

EOSC Service Providers Dashboard/Portal enables the front-end functionality for the registration of EOSC Providers, organizations entitled to publish their resources via the EOSC Catalogue, and offers them capabilities to onboard and manage EOSC resources. It also offers the Provider dashboard, where representatives from provider organizations have a detailed view on their offerings in the EOSC portal as well as various usage statistics on their resources. Finally, it offers to members of the onboarding team of the EOSC portal the functionality to manage the EOSC portal catalogue entries, i.e., manage the onboarding process of providers that apply to list their resources in the portal, audit on the onboarded resources, etc.
**Main exploitation pathways:** The service creation and further research exploitation paths were pointed as potential ways for future usage of the service.
**Overview of costs and income:**

- Service Creation, fully customised and supported: annual costs of up to €50k (pa).
- Further Research: one time costs of between €25k and €50k, plus annual costs of between €150k and €200k (pa).
- Income: Funding through participation in projects or procurement contracts.

**Treatment of personal data:**
Data Controllers for EOSC Beyond Innovation Sandbox
Athena-Research and Innovation Center in Information, Communication and Knowledge Technologies-Athena RC
Artemidos 6 and Epidavrou
15125, Maroussi, Athens, Greece
Tel: + 302106875300
Email: **dpo@athena-innovation.gr**
Data Controllers in other cases
Research Infrastructures that use the service.

# 3. EOSC Research Product Catalogue

**Description**

EOSC Resource Product Catalogue (**https://open-science-cloud.ec.europa.eu/resources/all** )The Research Product Catalogue is designed to provide the necessary infrastructure for storing, managing, and ensuring the discoverability of various research outputs, such as datasets, publications, software, and more. This catalogue enables programmatic access and supports the registration and management of research products, allowing researchers and institutions to easily contribute their outputs to the broader EOSC Beyond ecosystem. The catalogue also ensures compliance with the FAIR (Findable, Accessible, Interoperable, and Reusable) principles, promoting open science and data sharing.

The EOSC Resource Product Catalogue is powered by the OpenAIRE Graph (**https://graph.openaire.eu/**). The OpenAIRE Graph is a free and open resource that brings together and interlinks hundreds of millions of metadata records from over 100k data sources trusted by researchers. The project broke ground in 2012 being one of the first research knowledge graphs and has now grown into one of the world's largest and is the authoritative source for the European Open Science Cloud (EOSC). Here, researchers, communities, institutions, companies, and citizens thrive by freely sharing research products and related information. Graph indexes more than 302 millions of research products.

**Alternatives:** There are no direct competitors to the service within the EOSC ecosystem. The alternatives are all commercial or funded and supported via sponsorships, communities (i.e. **Scopus**, **Web of Science**, **Semantic Scholar**, **Dimensions**, **Lens**). None of them has the functionality or capacity to include the set of products contained in data sources that are registered to the EOSC Resource Catalogue.

There are some competitors that are active on Open Science as initiatives or as services provided by commercial companies and are presented below.

**Scopus (https://www.elsevier.com/products/scopus)**

Scopus is a source-neutral abstract and citation database curated by independent subject matter experts who are recognised leaders in their fields. Scopus puts powerful discovery and analytics tools in the hands of researchers, librarians, research managers and funders to promote ideas, people and institutions.

**Web of Science**

**(https://clarivate.com/academia-government/scientific-and-academic-research/research-discovery-and-referencing/web-of-science/)**

The Web of Science is a bibliographic database of scholarly articles from 22,000 peer-reviewed journals worldwide. The platform provides tools for advanced search, citation analysis and bibliometrics. Access via this catalogue record. The Learning Resources Hub provides self-paced training for the Web of Science.

**Semantic Scholar (https://www.semanticscholar.org/)**

Semantic Scholar provides free, AI-driven search and discovery tools, and open resources for the global research community.

Indexes over 200 million academic papers sourced from publisher partnerships, data providers, and web crawls.

**Dimensions (https://www.dimensions.ai/)**

Dimensions provides a suite of research applications and time-saving solutions that connect the dots across the research ecosystem for rapid insight. Hosts the largest collection of

interconnected global research data, including over 70% of publications with full-text indexing.

**Lens.org (https://www.lens.org/)**

The Lens serves global patent and scholarly knowledge as a public good to inform science and technology enabled problem solving. The Lens is bridging the cultures of scholarly research with invention and industry to make it as easy as possible to discover, analyse, and map global innovation knowledge. The Lens, seeks to source, merge and link diverse open knowledge sets, including scholarly works and patents, to inform discovery, analysis, decision making and partnering on a human-centered user experience built on an open web platform, Lens.org, with toolkits designed to optimise institutional effectiveness in problem solving. The Lens ingests, cleans, aggregates, normalises and serves over 272+ million scholarly works, 155+ million global patent records, and more than 495+ million patent sequences, with rich metadata including the people and institutions that generate this knowledge and the linkages between them, drawn from diverse data sources.

**Note**: All descriptions and numbers publicly available on public competitive services websites as of August 5th, 2025.

**Intellectual property:** Open-source software, in public repository, available for use under GNU GPL v3.0 licence or Apache 2.0.

**Components:** The service has plenty of components as part of its workflow and complementary for EOSC services.

Background IP

- Knowledge Graph – Metadata
- Aggregation system
- Knowledge Graph – File Crawling/ Aggregation system
- Knowledge Graph – Information Inference System
- Knowledge Graph – Deduplication System
- Knowledge Graph – Statistics
- Knowledge Graph – Data/Graph Provision System
- Research Product Provider Dashboard
- Updates to the data model of the EOSC Knowledge graph (services)
- Deduplication of services and data sources
- EOSC Tagging
- Mining to find links between publications and EOSC services
- Research Product Catalogue
- Documentation about Research Product Provider Portal
- Knowledge Graph – Provision of Data Dumps

Foreground IP

- EOSC Resource Product Catalogue Knowledge Graph (IPR or related or dependent service(s) or components: EOSC Service Catalogue)
- EOSC Research Product Dashboard integrated with the EOSC Service Provider Dashboard (IPR or related or dependent service(s) or components: EOSC Service Provider Dashboard)

**Main exploitation pathways:** Service Creation, Further Research

**Overview of costs and income:**

- Service Creation: annual costs of between €100k and €150k (pa).
- Further Research: annual costs of between €100k and €150k (pa).

In such a service, where there is workflow of orchestrated components, to further exploit them individually and integrate or use in another environment, it becomes very hard and costly. The components are not a plug and play solution for any other pipeline and environment. Therefore, the know-how, expertise, time and costs, to expose the software to third parties, is high.

- Income: The service is directly in operation via EC funds and indirectly by internal allocation of funds by OpenAIRE.

**Treatment of personal data:**

Data Controller details:
OpenAIRE AMKE
Artemidos 6 and Epidavrou
15125, Maroussi, Athens, Greece
Tel: + 302106875300
Email: dpo@openaire.eu

Personal data processed: Metadata included in publications, software, datasets and other research products may contain any of the following personal information of authors and other contributors:

- First Name,
- Family Name,
- Other Names,
- Name Identifier like ORCID id,
- Affiliation

Legal basis for processing: Performance of a contract and/or the performance of a task carried out in the public interest.
Purpose of data processing: Aggregate, curate, and disseminate scholarly metadata. Support open science, transparency, access to public scholarly, via APIs and downloads. Support functionalities of EOSC services.
Data processor: UNIWERSYTET WARSZAWSKI (UNIWARSAW/ICM) is an OpenAIRE member responsible for the storage, maintenance, support, hosting and implementation of the platform/ service.
Data recipients essential for service provision: All research products released under an open licence are publicly available on Zenodo, on the EOSC Beyond Community here: https://zenodo.org/records/15772105.
Data transfers to third countries: No
Data retention period: As long as research products are publicly available.

# 4. EOSC Resource Discovery Hub (Search Service)

**Discovery Hub** (formerly known as Search Service) is a new core service, implementing joint discovery and access to all EOSC resources. It allows users to browse and search through the complete offering of EOSC Exchange resources, such as publications, datasets, software, services, data sources, and more. Functioning primarily as an advanced search facility with an intuitive user interface, it displays each resource's metadata, allowing users to easily assess the relevance and potential value of each resource before requesting access. This hub is accessible to both authenticated and unauthenticated users. It is directly

connected to another service named ReSearchConnect that enables a user workspace and collaboration based on artefacts found and accessed in DH.

**ReSearchConnect** provides a user space capability within the EOSC, enabling the composition and execution of diverse resources offered by different nodes across the federation, supporting both access and re-use. ReSearchConnect provides a collaborative research environment with three main functions:

- *access gate* - delivers a more personalised discovery experience, leveraging artificial intelligence and user preferences to tailor search results.
- *research workspace* - supports collaborative research by facilitating access, composability, and execution of research activities. Here, users can create their scientific projects, bookmark and organise resources relevant to their objectives, collaborate with other researchers, engage in discussions, and share experiences.
- *user dashboard* - provides a personal workspace with functionalities such as profile management, user groups, social features, favourites, and monitoring of individual activity across the platform.

**Alternatives:** Numerous data & service oriented search services, e.g. DataCite, Zenodo, FigShare, both commercial and academic.

**Intellectual property:** Open-source software, in public repository, available for use under GNU GPL v3.0 licence.

**Components:** Underlying infrastructure, standard open source code, customization, support

**Main exploitation pathways:** 1a) Deploy customised version of service, on either customer infrastructure or Cyfronet infrastructure, 1b) Deploy standard version of service on customer's infrastructure, with Cyfronet providing SLA-based support services, 2) Project based deployment with research-driven innovation, as well as complementary training and outreach.

**Overview of costs (by exploitation path):**

- Service Creation, fully customised and supported: one time costs between €25k and €50k, and annual costs between €200k and €250k (pa).
- Further Research: one time costs of between €100k and €150k, plus annual costs of between €100k and €150k (pa).

**Treatment of personal data:** Personal data (identifiers and user activity) is stored. The provider acts as a Data Processor with a data processing agreement with the client (in this case EGI Foundation, representing the EOSC Beyond consortium).

# 5. EOSC EXPLORE

**Description:** EOSC EXPLORE is a key component of the EOSC Beyond initiative, providing researchers with an intuitive platform to discover, access, and integrate a wide range of scientific resources from multiple EOSC Nodes. By leveraging the EOSC Interoperability Framework, EOSC Explore ensures seamless cross-domain access and compliance with FAIR data principles, empowering researchers to compose scientific workflows, foster collaboration, and accelerate scientific discoveries within a federated Open Science ecosystem.

**Alternatives:** The service competitors are plenty, but not part of the EOSC ecosystem and not interoperable with EOSC.Therefore, they are all indirect competitors.

**Dimensions Free** -

**https://www.dimensions.ai/products/all-products/dimensions-free-version/**
It's an " All publications and citations together with rich contextual information – freely available for personal, non-commercial use."
**Lens.org https://www.lens.org/**
The Lens serves integrated scholarly and patent knowledge as a public good to inform science and technology enabled problem solving.
**Semantic Scholar** - **https://www.semanticscholar.org/**
A free, AI-powered research tool for scientific literature
**CORE UK** - **https://core.ac.uk/**
"The world's largest collection of open access research papers."
**Intellectual property:** Licence Apache 2.0
**Components:**
Background IP

- EOSC Resource Catalogue API
- Data Transfer

Foreground IP

- EOSC EXPLORE and EOSC Beyond Marketplace: EOSC Marketplace and EOSC Explore offered "as a package" or "as a service"

**Main exploitation pathways:** The exploitation path of EOSC EXPLORE is the pursuit of Further Research, since its the frontend of the Research Product Catalogue that provides to users their search results on a web friendly UI.
**Overview of costs and income:**

- Further Research: annual costs between €100k and €150k (pa).
- Income: The service is directly funded via EC funds and indirectly by internal allocation of funds by OpenAIRE.

**Treatment of personal data:** Based on the publicly available **Data Protection Policy** of OpenAIRE and EGI regarding the EOSC Explore and Data Transfer services.

Data controllers
OpenAIRE AMKE
Artemidos 6
1512 Maroussi, Greece

EGI Foundation
Science Park 140
1098 XG Amsterdam
Netherlands
E-mail: **dpo@egi.eu**

Personal data processed
The following Personal Data are obtained through the services:

- username
- password credentials in order to pass this information to the backend service.

These data will not be stored, but will be used as a parameter of a request to the API of the backend service.

Legal basis for processing: Performance of a contract and/or the performance of a task carried out in the public interest.
Purpose of data processing: The processing of Personal Data means any operation or set of operations that is performed on Personal Data or on sets of Personal Data, whether or not by automated means, including collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure, or destruction of the Personal Data.
The Personal Data identified in the following section are processed for the purpose of collecting, analysing, and presenting data for the purposes of offering OpenAIRE services.
Data processor: OpenAIRE AMKE and EGI Foundation.
Data recipients essential for service provision: Designated OpenAIRE and the EGI Foundation administrators will have access to the Personal Data in order to perform necessary activities for the processing of the collected monitoring data. A log will be kept and will be made accessible if required by law or contract upon request.
Personal Data may also be shared with (designated representatives of) the members of the OpenAIRE for the offering of the OpenAIRE services. The Data Controllers will in this case transfer the relevant Personal Data and enter into a Data controllers to controllers relationship with the OpenAIRE members. Due diligence will be performed to ensure that OpenAIRE has adequate Personal Data policies in place before transferring the Personal Data. A log will be kept and will be made accessible if required by law or contract upon request.
Data transfers to third countries: No
Data retention period: All Personal Data obtained for the purposes of OpenAIRE services will be kept for the period offering such services.

# 6. EOSC Monitoring Service

**Description**: Monitoring is a service to gain insights concerning availability and reliability of the services into an infrastructure. Black box/External Monitoring tries to emulate the end-user behaviour.
**Alternatives**: There is no direct competition for the service, although availability and reliability statistics can be derived from internal/fabric monitoring data, which can be provided by many internal/fabric monitoring tools, such as https://uptimerobot.com/.
**Intellectual property:** Open source software, available on a public repository under an Apache 2.0 licence.
**Components:** multiple but tightly integrated.
**Main exploitation pathways:** Further Research and funding via EU/EOSC grants/projects or as a software/service to industry.
The Monitoring Service will be sustained through the following activities:

- Participation in research projects (national and European) and collaborations with adopting organisations.
- Participation in procurement actions.

**Overview of costs and income**:

- Service Creation, fully customised and supported: one time costs up to €50k , annual costs between €200k and €250k (pa).

- Income: through participation in research projects and procurement actions.

**Treatment of personal data:**

- You agree that logged information, including personal data provided by you for registration purposes, may be used for administrative, operational, accounting, monitoring and security purposes. You agree that this logged information may be disclosed to other authorised participants via secured mechanisms, only for the same purposes and only as far as necessary to provide the services.
- You agree that the body or bodies granting you access and resource/service providers are entitled to regulate, suspend or terminate your access without prior notice and without compensation, within their domain of authority, and you shall immediately comply with their instructions.

## 7. Accounting for Research Products

**Description**: EOSC Accounting for Research Products collects, processes and publishes usage statistics for research products from EOSC Providers, using automated and standardised methods. The service is built upon the UsageCounts service of OpenAIRE.

**Alternatives:**

IRUS - **https://irus.jisc.ac.uk/r5/**

IRUS (Institutional Repository Usage Statistics) is a standards-based statistics service that enables participating institutions to share and compare information about usage of items in their institutional and research data repositories.

OPERAS Metrics - **https://metrics.operas-eu.org/**

As part of Work Package 6 of the HIRMEOS project Ubiquity Press and Open Book Publishers has developed open source software to allow collection and normalisation of third-party usage metrics, used to populate a database of title-specific data that allows its analysis and visualisation.

MakeDataCount - **https://makedatacount.org/**

Make Data Count promotes the development of open data metrics to enable evaluation of data usage.

KU Open Analytics - **https://knowledgeunlatched.org/ku-open-analytics/**

KU Open Analytics harmonises different usage reports and combines multiple sources to generate a unique overview of which content is being used.

**Note**: EOSC Accounting is integrated and fully compatible with the EOSC platform.

**Intellectual property**: CC ATTRIBUTION 4.0 INTERNATIONAL LICENSE (CC-BY)

**Components:**

Background

- UsageCount BackEnd
  - OpenAIRE Piwik DSpace
  - OpenAIRE Piwik tracker for EPrints
  - Generic Usage Activity Tracker for OpenAIRE
- UsageCount UI
  - OpenAIRE Usage Statistics API
  - OpenAIRE Usage Statistics Sushilite

Foreground

- Accounting for Research Products extension to improve support for provenance: The Service will be extended to collect from the OpenAIRE Graph provenance information about the organisations behind the authors of given research product; it will offer APIs to access aggregated usage statistics at organisational level, as well as for sets of PIDs.
- New Updated Documentation about EOSC Accounting for Research Products: Based on the extensions of the service an updated version of the documentation will be available

**Main exploitation pathways:** The service could be exploited as a Further Research, including its components.
**Overview of costs and income:**

- Further Research: annual costs of between €100k and €150k (pa).
- Income: through participation in research projects and procurement actions.

**Treatment of personal data:**

Data controllers
OpenAIRE AMKE
Artemidos 6
1512 Maroussi, Greece
Tel: + 302106875300
Email: **dpo@openaire.eu**

UNIVERSIDADE DO MINHO (UMINHO),
Largo Do Paco,
Braga, 4704553, Portugal.
Department Documentation Services, Campus de Gualtar, Edifício 04, Braga, 4710057, Portugal.
**protecaodados@uminho.pt**
Tel: +351 253 601 100

Personal data processed: N/A
Legal basis for processing: Consent
Purpose of data processing: The service processes only repositories' (as research products) usage information for statistical analysis and analytics.
Data processor: UNIWERSYTET WARSZAWSKI (UNIWARSAW/ICM) is an OpenAIRE member competent for the storage, maintenance, support, hosting and implementation of the platform/ service.
Data recipients essential for service provision: None
Data transfers to third countries: No
Data retention period: Until the data source is deleted from EOSC platform.

# 8. Helpdesk

The EOSC Helpdesk provides a centralised support service for users across multiple communities and e-infrastructures. The EOSC Helpdesk service is based on the open source Zammad platform.

**Alternatives:** RT (Request Tracker), ServiceNow, ZenDesk, OTRS. Some proprietary/commercial, others open source with licensing.
**Intellectual property**: Implementation of instances of Zammad, which is Open Source. Some custom features implemented by Zammad for KIT and EOSC, some implemented as configurations of Zammad by KIT, all open source. (The Zammad software is available using a variety of open source licences. )
**Components**: Based on Zammad.
Main exploitation pathway: 1) Deploy customised instance(s) of Zammad for each customer, including EOSC Beyond, EOSC EU Node, other clients; 2) Helpdesk as-a-Service. Optional services: bidirectional integration with another helpdesk system, integration with AI capabilities (privately hosted by KIT for data protection)
**Overview of costs and income:**

- Full service instance of HD: one time costs up to €25k, plus annual costs up to €50k (pa).
- Helpdesk as-a-Service: one time costs up to €25k plus annual costs up to €50k (pa).
- Integration with another HD system: one time costs up to €25k, plus annual costs up to €50k (pa).
- Integration with AI: one time costs up to €25k, plus annual costs up to €50k (pa).
- Income: covered by project funding where KIT is a partner in the project. Exploring other arrangements that would allow KIT to provide this service without also becoming a project partner.

**Treatment of personal data**: Helpdesk systems must store personal data about clients as well as information about what they need help with. Service provider (KIT) operates as the data processor, subject to DPA with a relevant entity acting as controller (in the case of EOSC Beyond, the EOSC Beyond project consortium with EGI Foundation acting as the lead). For AI Integration, the planned offer includes local hosting of the AI model by the service provider in order to prevent leakage of personal data beyond the service provider to an external host of an external AI model.

# 9. EOSC Interoperability Framework Registry

**Description**: The EOSC Interoperability Registry provides data and functionality to register, maintain, administer, Interoperability Guidelines that Resources onboarded to the Service Catalogue adhere to. Interoperability Guidelines are human readable documents that specify guidelines for achieving compatibility and/or composability of resources to specific procedures/standards/specifications. They are to evolve into more machine-readable form so as for resource providers to be able to specify configurations for their resources based on guideline templates. Also, researchers will be able use those configurations to compose resources to higher order components and services.
**Alternatives**: No alternatives compatible to the EOSC ecosystem are known so far.
**Intellectual property:**
Foreground

- EOSC Beyond Registry
- EOSC Beyond Providers Portal
- EOSC Beyond Interoperability Registry

The software is open source and available on public repository under an Apache 2.0 or AGPL 3.0 licence.
**Components:** based on a single component.
**Main exploitation pathways:** Service creation and Further research.
**Overview of costs and income:**

- Service Creation, fully customised and supported: annual costs of up to €50k (pa).
- Further Research: annual costs between €150k and €200k (pa).
- Income: Funding through participation in projects or procurement contracts.

**Treatment of personal data:** No personal data

## 10. EOSC Deployment Service

**Description**: The service is part of the EOSC Beyond Execution Framework and is able to create and configure virtual infrastructures on top of public, private and federated cloud providers. The service uses the **TOSCA standard** to define the infrastructures.
**Alternatives:** Other Infrastructure as Code (IaC) competitors, such as Terraform, Cloudify, Puccini or xOpera.
**Intellectual property:** Based on the Infrastructure Manager (IM) (**https://im.egi.eu/**), owned by Universitat Politècnica de València (UPV), and offered as open source, under a GNU GPL v3.0 licence.
**Components:** Based on a single component, Infrastructure Manager (IM).
**Main exploitation pathways:** 1) **Service creation**, meaning the deployment of a specific instance of the IM to satisfy the particular needs of a stakeholder; and 2) **Further research**, whose expected outcomes are research collaboration and projects, education (curricula), training, and publications.
**Overview of costs and income:**

- Service Creation, fully customised and supported: annual costs between €50k and €100k (pa).
- Further Research: annual costs of between €50k and €100k (pa).
- Income: Funding through participation in projects or procurement contracts.

**Treatment of personal data:** The privacy policy of the service states that no personal data is stored by IM, and the credentials temporarily needed are stored in an external “vault” service.

## 11. EOSC Data Transfer

**Description**: The EOSC Data Transfer Service is a horizontal service that allows easy transfer of datasets found in the EOSC Discovery Hub to any computing infrastructure accessible to EOSC users. The service offers three sets of functionalities: parsing of data repositories identified by PIDs, creating and managing data transfers, and managing storage elements (e.g. files/folders or objects/buckets, depending on the storage system type). The service harmonises these functionalities across multiple actual implementations, which can easily be configured, decoupling its clients from the intricacies of actual implementations, e.g. a particular data transfer engine, preventing feature lock-in. This allows each EOSC Node to use their own transfer engine(s) to offer the same functionality to EOSC users, under the same generic API, preventing provider lock-in. All three functionalities are extensible with

support for additional data repository types, wrapped data transfer engines, or supported storage system types.

**Alternatives:** No direct competition for EOSC Data Transfer, which is a generic data transfer service where the actual transfer engine and/or the storage element manipulator can be swapped or equally supported as required by the customer. EOSC users can instead use specific data transfer engines/services directly (if they have access to one), but that will lock them into that specific service.

**Intellectual property:** Open-source software, in public repository, available for use under Apache 2.0 licence.

**Components:** Data Transfer API that offers the functionalities described above; Data Transfer UI integrated into the detail pages of datasets in the EOSC Discovery Hub, allowing initiating, configuring, and executing complete or partial transfers of the dataset to any computing storage system accessible to EOSC users. Plus underlying data transfer services – economic analysis is based on CERN's File Transfer Service (FTS), which CERN provides on an in-kind basis, but for this analysis a cost is ascribed to this.

**Main exploitation pathways**: Only 1 – service creation

**Overview of costs and income:**

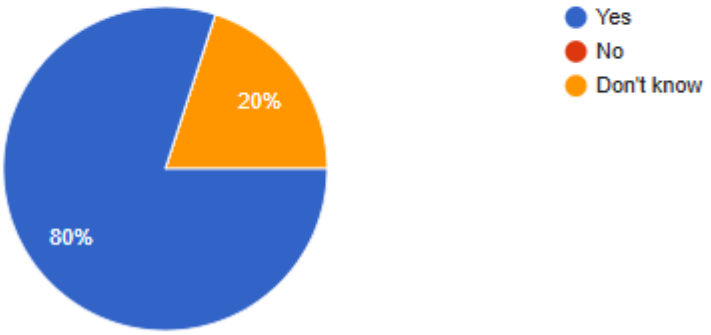
- Costs: one time costs up to €50k, plus annual costs between €50k and €100k (pa).
    - Assumed CERN FTS costs: €50k (pa).
- Income: funding from projects or procurement actions.

**Treatment of personal data**: minimal personal data involved (user info to set up data transfers); data protected through data processing agreements with project/contracting consortia.

# Appendix B - Service Provider Survey Response Summary

1. Are you interested in learning more about, and considering, different possible future financial sustainability pathways for your service and/or its components? For example, licencing IPR, software-as-a-service, component/service is offered in response to a procurement exercise, component/service is offered as a paid-for service.

5 responses



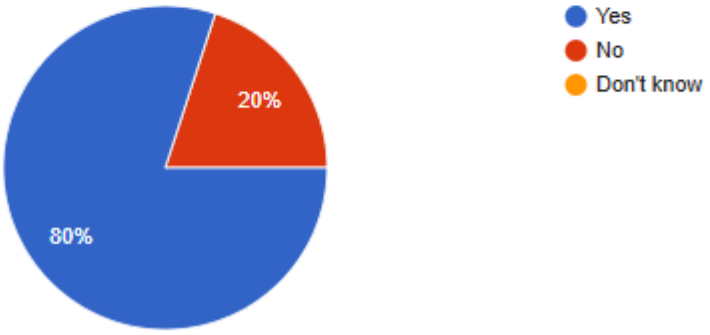

2. Please provide a short explanation, to help T3.4 to understand your answer

5 responses

| |
|---|
| Better management of the service from the product management perspective |
| It would be interesting to know additional potential sustainability options. |
| We (CESNET) are looking at future possibilities of sustaining the EOSC CZ Node, and we are interested in seeing options and possible ideas, as well as joining in coordinated action. |
| I would like to better understand the software-as-a-service, and as a paid-for service options. |
| Most of the services (or components) we provide as OpenAIRE are open source and serve OpenScience, with identified IPR, and a free to user financial model. If in the future something changes, of course it would be good to learn more options. |

3. Would you be interested in working with T3.4 to gather and analyse information, for example about cost components, potential markets/audiences etc, to further explore and prepare for a variety of financial sustainability pathways? This could be of some help to service providers in understanding and completing section 4 of the EOSC Beyond Core Service Portfolio template, but also in elaborating further detail to support the identified possible exploitation pathways.

5 responses




(The “no” response to this question was a personal response from an individual who knew that one of his colleagues was already participating in T3.4.)

4. Please provide a short explanation, to help T3.4 to understand your answer

3 responses

Already a part of it ;)

This is answering on behalf of the company (CESNET) rather than on my personal one. I would like to know more about the expertise required (or useful) to T3.4 and help delegate CESNET representatives with adequate backgrounds.

SInce we participate in this task, we have a representative there already.

Organisation

5 responses

Cyfronet

Universitat Politècnica de València

CESNET

ATHENA RC

OpenAIRE

Please list which service(s) and component(s) you are responding about (list all)

5 responses

Marketplace, Discovery Hub, User Dashboard

Deployment Service

EOSC CZ Node: EOSC Beyond pilot.

Service Registry, Providers Portal, Interoperability Framework Registry

EOSC research product catalogue, EOSC Explore, EOSC Data Transfer (GUI), EOSC Accounting for Research Products

# Appendix C - Information Collection Template

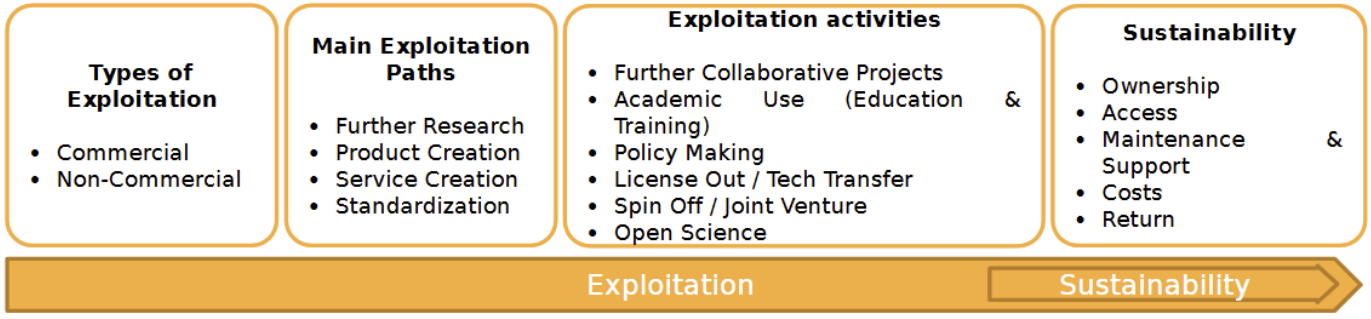
## EOSC Beyond Core Services: Financial Sustainability Analysis

Template for gathering financial sustainability information

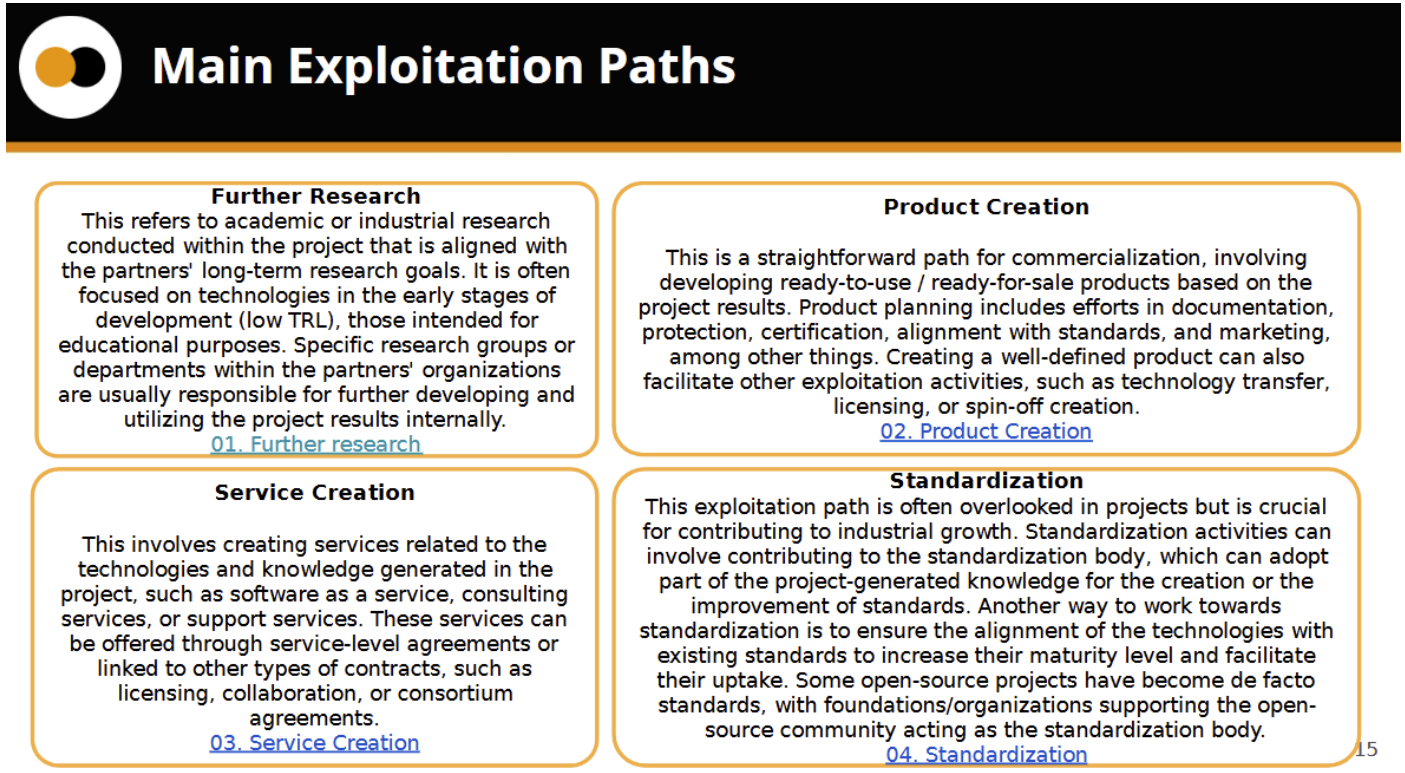
Information for respondents:

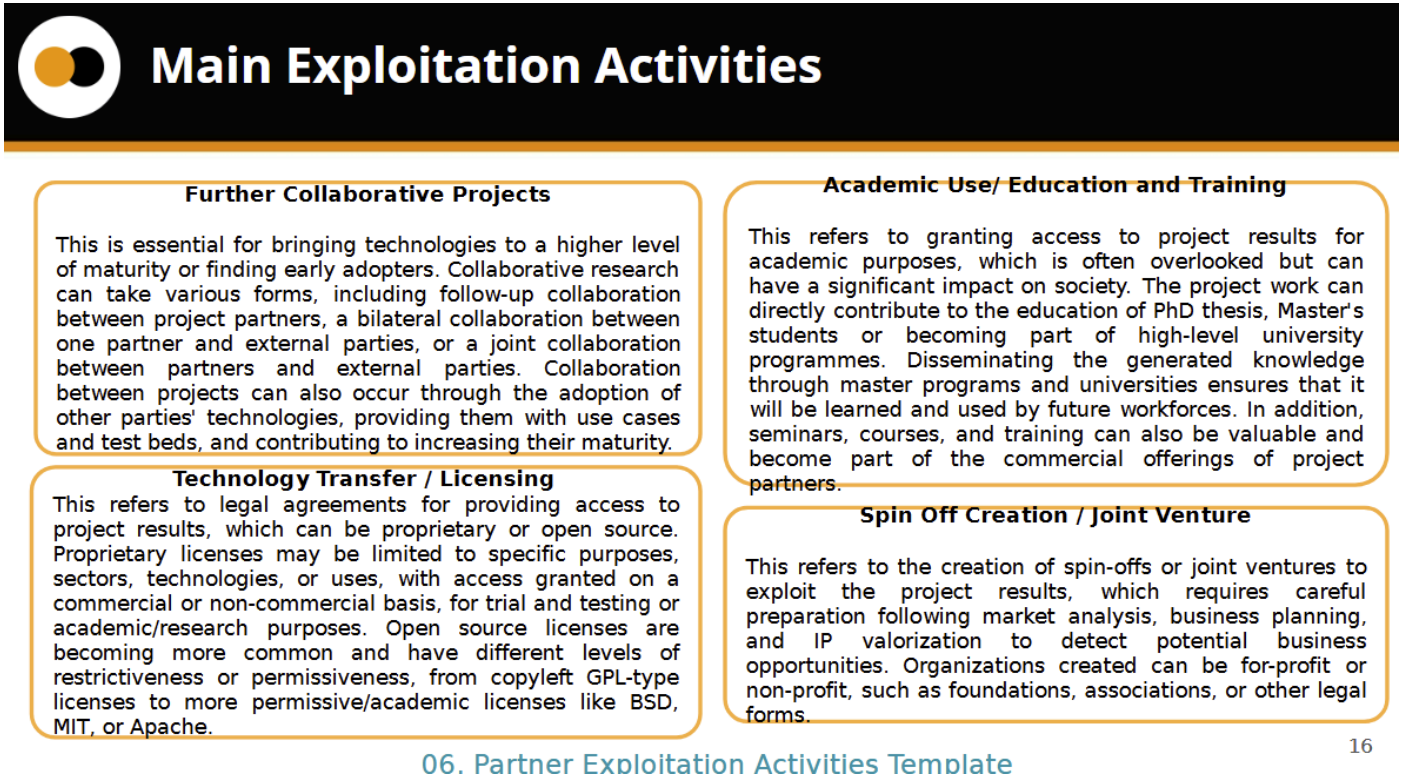
This template is focussed on financial sustainability - i.e. funding or income to pay for the costs of operating and maintaining a service or component. It is a supplement to, and builds on, the **EOSC Beyond Service Portfolio information**. The Service Portfolio template collects initial information about each service's cost components and potential future funding sources, as well as - at the component level - the expected exploitation paths and their likely funding. This template collects more detailed information which there was insufficient room to include in the Service Portfolio template. This work is complementary to the Innovation Management (T3.1) activity, which has a broader scope: T3.1 addresses the whole innovation process, and does this for the whole project; the Financial Sustainability task (T3.4) is focussed on Core (and Horizontal) services only, and works at a more detailed level (mostly at the individual component level) to analyse how they will be paid for in future. In providing the requested information below, please consider a **time period of approximately 5 years after the end of the EOSC Beyond project - i.e. from 2027 until 2032**.

Possible information for adding to the Service Portfolio Catalogue template, to collect more comprehensive information on Exploitation paths (copied from InterTwin project):



Supporting information which could be added to Confluence for reference:




Main Exploitation Activities
Further Collaborative Projects
This is essential for bringing technologies to a higher level of maturity or finding early adopters. Collaborative research can take various forms, including follow-up collaboration between project partners, a bilateral collaboration between one partner and external parties, or a joint collaboration between partners and external parties. Collaboration between projects can also occur through the adoption of other parties' technologies, providing them with use cases and test beds, and contributing to increasing their maturity.
Technology Transfer / Licensing
This refers to legal agreements for providing access to project results, which can be proprietary or open source. Proprietary licenses may be limited to specific purposes, sectors, technologies, or uses, with access granted on a commercial or non-commercial basis, for trial and testing or academic/research purposes. Open source licenses are becoming more common and have different levels of restrictiveness or permissiveness, from copyleft GPL-type licenses to more permissive/academic licenses like BSD, MIT, or Apache.
Academic Use/ Education and Training
This refers to granting access to project results for academic purposes, which is often overlooked but can have a significant impact on society. The project work can directly contribute to the education of PhD thesis, Master's students or becoming part of high-level university programmes. Disseminating the generated knowledge through master programs and universities ensures that it will be learned and used by future workforces. In addition, seminars, courses, and training can also be valuable and become part of the commercial offerings of project partners.
Spin Off Creation / Joint Venture
This refers to the creation of spin-offs or joint ventures to exploit the project results, which requires careful preparation following market analysis, business planning, and IP valorization to detect potential business opportunities. Organizations created can be for-profit or non-profit, such as foundations, associations, or other legal forms.
16
06. Partner Exploitation Activities Template

# <Service name>

<One Confluence page per service>

## 1. Type of Service

Tick all that apply

- ☐ Hardware & Infrastructure  (i.e. VMs, GPUs, CPUs, servers, data centers, network or cloud infrastructure)
- ☐ Policy & Compliance (governance, security)
- ☐ Service
- ☐ Software & Tools (toolkits, development, monitoring, order, diagnostics, analytics, custom software, applications, components)
- ☐ Training & Support (skills training, helpdesk)
- ☐ Other (please specify)

## 2. Service Competition

Are there any alternative solutions to this service, which target users adopt? If so, please name them and provide basic details (max 300 words)

| |
|---|
| |

## 3. Exploitation Paths - Costs

Some exploitation paths may be for the service as a whole, while some may be for particular component(s). Please include information about all of them in this section.

For each exploitation path, list and quantify the cost components involved. If a cost component is not relevant for a given exploitation path, leave that row blank. Add additional rows as required.

## a. Service X

*Elaborate on each exploitation path, and quantify the effort, in person months (PMs), you need for each one. Distinguish between the different types of cost.*

<table>
<tr><td colspan="4"><Exploitation path 1></td></tr>
<tr><td colspan="4">Description: Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)</td></tr>
<tr><td colspan="4">Outputs: what outputs do you expect from this exploitation path?</td></tr>
<tr><td colspan="2">Non-financially evaluated outputs<br>Free Access to Data/Service/Facility<br>Publications<br>User/Marketing Strategy<br>Workshops<br>Other (please specify)</td><td colspan="2">Financially evaluated outputs<br>Paid Access to Data/Service/Facility<br>IP Licence<br>Contract research<br>Training<br>Consultancy<br>Education<br>Other (please specify)</td></tr>
<tr><td colspan="4">Related or dependent services or components: does this exploitation path also involve other services or components? List all which apply</td></tr>
<tr><td></td><td>Activity</td><td>Effort per month/per annum (please specify) (PMs) Identify the type of expertise required (e.g. technical, legal/policy, comms, business development, marketing, administration, sales, etc)</td><td>Other direct costs (identify the type of cost, like storage, VMs, other services, material, other software to support activities, etc) per month/per annum (please specify) (€)</td></tr>
</table>

| | | | |
|---|---|---|---|
| | **Historical costs (costs already incurred but which might be recouped in future)** | | |
| | Development, R&D | | |
| | Other (please specify) | | |
| | **Costs which would be incurred in future for this exploitation path** | | |
| | Setup and configuration | | |
| | Operation (including infrastructure and hosting) | | |
| | Integration within EOSC Federation (including Core services integration) | | |
| | Support and maintenance (including security) | | |
| | Documentation and training | | |
| | Business and Engagement activities | | |
| | Other (please specify) | | |
| | Other (please specify) | | |
| **<Exploitation path 2>** | | | |
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | | | |
| Outputs: *what outputs do you expect from this exploitation path?* | | | |
| **Non-financially evaluated outputs**<br>Free Access to Data/Service/Facility<br>Publications<br>User/Marketing Strategy<br>Workshops<br>Other (please specify) | | **Financially evaluated outputs**<br>Paid Access to Data/Service/Facility<br>IP Licence<br>Contract research<br>Training<br>Consultancy<br>Education | |

| | | | |
|---|---|---|---|
| | | Other (please specify) | |
| Related or dependent services or components: *does this exploitation path also involve other services or components? List all which apply* | | | |
| | **Activity** | **Effort per month/per annum (please specify) (PMs) Identify the type of expertise required (e.g. technical, legal/policy, comms, business development, marketing, administration, sales, etc)** | **Other direct costs (identify the type of cost, like storage, VMs, other services, material, other software to support activities, etc) per month/per annum (please specify) (€)** |
| | **Historical costs (costs already incurred but which might be recouped in future)** | | |
| | Development, R&D | | |
| | Other (please specify) | | |
| | **Costs which would be incurred in future for this exploitation path** | | |
| | Setup and configuration | | |
| | Operation (including infrastructure and hosting) | | |
| | Integration within EOSC Federation (including Core services integration) | | |
| | Support and maintenance (including security) | | |
| | Documentation and training | | |
| | Business and Engagement activities | | |
| | Other (please specify) | | |
| | Other (please specify) | | |

| **<Exploitation path 3>** |
|---|
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* |
| Outputs: *what outputs do you expect from this exploitation path?* |
| etc |

## b. Component A <name>

*Elaborate on each exploitation path, and quantify the effort, in person months (PMs), you need for each one. Distinguish between the different types of cost.*

| **<Exploitation path 1>** | |
|---|---|
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | |
| Outputs: *what outputs do you expect from this exploitation path?* | |
| **Non-financially evaluated outputs**<br>Free Access to Data/Service/Facility<br>Publications<br>User/Marketing Strategy<br>Workshops<br>Other (please specify) | **Financially evaluated outputs**<br>Paid Access to Data/Service/Facility<br>IP Licence<br>Contract research<br>Training<br>Consultancy<br>Education<br>Other (please specify) |
| Related or dependent services or components: *does this exploitation path also involve other services or components? List all which apply* | |

| | **Activity** | **Effort per month/per annum (please specify) (PMs) Identify the type of expertise required (e.g. technical, legal/policy, comms, business development, marketing, administration, sales, etc)** | **Other direct costs (identify the type of cost, like storage, VMs, other services, material, other software to support activities, etc) per month/per annum (please specify) (€)** |
|---|---|---|---|
| | **Historical costs (costs already incurred but which might be recouped in future)** | | |
| | Development, R&D | | |
| | Other (please specify) | | |
| | **Costs which would be incurred in future for this exploitation path** | | |
| | Setup and configuration | | |
| | Operation (including infrastructure and hosting) | | |
| | Integration within EOSC Federation (including Core services integration) | | |
| | Support and maintenance (including security) | | |
| | Documentation and training | | |
| | Business and Engagement activities | | |
| | Other (please specify) | | |
| | Other (please specify) | | |
| **<Exploitation path 2>** | | | |
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | | | |
| Outputs: *what outputs do you expect from this exploitation path?* | | | |
| **Non-financially evaluated outputs** | | **Financially evaluated outputs** | |

| | |
|---|---|
| Free Access to Data/Service/Facility<br>Publications<br>User/Marketing Strategy<br>Workshops<br>Other (please specify) | Paid Access to Data/Service/Facility<br>IP Licence<br>Contract research<br>Training<br>Consultancy<br>Education<br>Other (please specify) |

Related or dependent services or components: *does this exploitation path also involve other services or components? List all which apply*

| | **Activity** | **Effort per month/per annum (please specify) (PMs) Identify the type of expertise required (e.g. technical, legal/policy, comms, business development, marketing, administration, sales, etc)** | **Other direct costs (identify the type of cost, like storage, VMs, other services, material, other software to support activities, etc) per month/per annum (please specify) (€)** |
|---|---|---|---|
| | **Historical costs (costs already incurred but which might be recouped in future)** | | |
| | Development, R&D | | |
| | Other (please specify) | | |
| | **Costs which would be incurred in future for this exploitation path** | | |
| | Setup and configuration | | |
| | Operation (including infrastructure and hosting) | | |

| | | | |
|---|---|---|---|
| | Integration within EOSC Federation (including Core services integration) | | |
| | Support and maintenance (including security) | | |
| | Documentation and training | | |
| | Business and Engagement activities | | |
| | Other (please specify) | | |
| | Other (please specify) | | |
| **<Exploitation path 3>** | | | |
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | | | |
| Outputs: *what outputs do you expect from this exploitation path?* | | | |
| etc | | | |

## c. Component B <name>

*Elaborate on each exploitation path, and quantify the effort, in person months (PMs), you need for each one. Distinguish between the different types of cost.*

| **<Exploitation path 1>** | |
|---|---|
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | |
| Outputs: *what outputs do you expect from this exploitation path?* | |
| **Non-financially evaluated outputs**<br>Free Access to Data/Service/Facility<br>Publications<br>User/Marketing Strategy | **Financially evaluated outputs**<br>Paid Access to Data/Service/Facility<br>IP Licence<br>Contract research |

| | |
|---|---|
| Workshops<br>Other (please specify) | Training<br>Consultancy<br>Education<br>Other (please specify) |

Related or dependent services or components: *does this exploitation path also involve other services or components? List all which apply*

| | **Activity** | **Effort per month/per annum (please specify) (PMs) Identify the type of expertise required (e.g. technical, legal/policy, comms, business development, marketing, administration, sales, etc)** | **Other direct costs (identify the type of cost, like storage, VMs, other services, material, other software to support activities, etc) per month/per annum (please specify) (€)** |
|---|---|---|---|
| | **Historical costs (costs already incurred but which might be recouped in future)** | | |
| | Development, R&D | | |
| | Other (please specify) | | |
| | **Costs which would be incurred in future for this exploitation path** | | |
| | Setup and configuration | | |
| | Operation (including infrastructure and hosting) | | |
| | Integration within EOSC Federation (including Core services integration) | | |
| | Support and maintenance (including security) | | |
| | Documentation and training | | |

| | | | |
|---|---|---|---|
| | Business and Engagement activities | | |
| | Other (please specify) | | |
| | Other (please specify) | | |
| **<Exploitation path 2>** | | | |
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | | | |
| Outputs: *what outputs do you expect from this exploitation path?* | | | |
| **Non-financially evaluated outputs**<br>Free Access to Data/Service/Facility<br>Publications<br>User/Marketing Strategy<br>Workshops<br>Other (please specify) | | **Financially evaluated outputs**<br>Paid Access to Data/Service/Facility<br>IP Licence<br>Contract research<br>Training<br>Consultancy<br>Education<br>Other (please specify) | |
| Related or dependent services or components: *does this exploitation path also involve other services or components? List all which apply* | | | |
| | **Activity** | **Effort per month/per annum (please specify) (PMs) Identify the type of expertise required (e.g. technical, legal/policy, comms, business development, marketing, administration, sales, etc)** | **Other direct costs (identify the type of cost, like storage, VMs, other services, material, other software to support activities, etc) per month/per annum (please specify) (€)** |

| | | | |
|---|---|---|---|
| | **Historical costs (costs already incurred but which might be recouped in future)** | | |
| | Development, R&D | | |
| | Other (please specify) | | |
| | **Costs which would be incurred in future for this exploitation path** | | |
| | Setup and configuration | | |
| | Operation (including infrastructure and hosting) | | |
| | Integration within EOSC Federation (including Core services integration) | | |
| | Support and maintenance (including security) | | |
| | Documentation and training | | |
| | Business and Engagement activities | | |
| | Other (please specify) | | |
| | Other (please specify) | | |
| **<Exploitation path 3>** | | | |
| Description: *Provide basic details of this exploitation path, including pricing strategy (if relevant) and expected types of users (e.g. private, public etc) (300 words max)* | | | |
| Outputs: *what outputs do you expect from this exploitation path?* | | | |
| etc | | | |

### d. Component C <name>

and so on…

# 4. Ownership and Access: IPR Information

Specifying basic IPR information is helpful for determining who owns and controls access to the service/components, and to assist in considering exploitation paths for the services/components. T3.1 will need to gather more detailed IPR-related information in future for the project's exploitable results.

Please provide IPR/licensing foreground information for your service, at the individual component level, if known (e.g. use the information gathered during EOSC Future). It is sufficient to provide the IPR information as it was at the beginning of EOSC Beyond; updated information will be captured later by T3.1.

If any new components are being developed during EOSC Beyond however (as distinct from development of existing components), please also list them here and include IPR information if possible.

In the last column, please briefly list IPR protection assigned to any other services or components which would typically be exploited (bundled) together with that row's component.

| **Component name** | **Short description and url** | **Owner(s) (the organisations which own the IPR in the component)** | **Confidential (Yes/No)** | **Type of protection or licensing action used** | **Protection or licence used (e.g. licence type)** | **IPR of related or dependent service(s) or component(s)** |
|---|---|---|---|---|---|---|
| | | | | Patents<br>Trademarks<br>Registered designs<br>Utility models<br>Copyright<br>Others (please specify) | | |

# 5. Data Protection

*For each service, consider who the data controller(s) and processor(s) will be. These may be different for different exploitation paths for the same service.*

| **Service** | Who will be the data controller(s)? | Who will be the data processor(s)? | Link to privacy policy (per exploitation path?) | General rules applicable to this exploitation path (“lay language” guidance for users) |
|---|---|---|---|---|
| **Service A** | | | | |
| **<Exploitation path 1>** | | | | |
| | | | | |
| **<Exploitation path 2>** | | | | |
| | | | | |
| **<Exploitation path 3>** | | | | |
| | | | | |
| **Service B** | | | | |
| **<Exploitation path 1>** | | | | |
| | | | | |
| **<Exploitation path 2>** | | | | |

| **Service** | Who will be the data controller(s)? | Who will be the data processor(s)? | Link to privacy policy (per exploitation path?) | General rules applicable to this exploitation path (“lay language” guidance for users) |
|---|---|---|---|---|
| | | | | |
| **<Exploitation path 3>** | | | | |
| | | | | |
| **Service C** | | | | |
| **<Exploitation path 1>** | | | | |
| | | | | |
| **<Exploitation path 2>** | | | | |
| | | | | |
| **<Exploitation path 3>** | | | | |
| | | | | |
| etc | | | | |

# 6. Exploitation Paths - Income

For each exploitation path, for the service as a whole or for each component, list and quantify the expected/possible income streams.

| **Service/Component** | **Income stream and type (internal/external)** | **Funding provider name and type. E.g. EC, national/regional public institution, own institution, private donor (commercial? not-for-profit?), other (please specify)** | **For how long would this income stream sustain the service/component after EOSC Beyond?** | **Expected amount of income per month/year from this source (€)** | **What risks do you believe are associated with this income stream?** |
|---|---|---|---|---|---|
| **Service X** | | | | | |
| **<Exploitation path 1>** | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 2>** | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 3>** | | | | | |
| Description: *Provide basic details of this exploitation path* | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |

| Service/Component | Income stream and type (internal/external) | Funding provider name and type. E.g. EC, national/regional public institution, own institution, private donor (commercial? not-for-profit?), other (please specify) | For how long would this income stream sustain the service/component after EOSC Beyond? | Expected amount of income per month/year from this source (€) | What risks do you believe are associated with this income stream? |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| **Component A** | | | | | |
| **<Exploitation path 1>** | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 2>** | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 3>** | | | | | |
| Description: *Provide basic details of this exploitation path* | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |

| Service/Component | Income stream and type (internal/external) | Funding provider name and type. E.g. EC, national/regional public institution, own institution, private donor (commercial? not-for-profit?), other (please specify) | For how long would this income stream sustain the service/component after EOSC Beyond? | Expected amount of income per month/year from this source (€) | What risks do you believe are associated with this income stream? |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| **Component B** | | | | | |
| **<Exploitation path 1>** | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 2>** | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 3>** | | | | | |
| Description: *Provide basic details of this exploitation path* | | | | | |
| Related or dependent services or components: *comment briefly on whether expected income streams include or are dependent on related services or components* | | | | | |
| | | | | | |

| Service/Component | Income stream and type (internal/external) | Funding provider name and type. E.g. EC, national/regional public institution, own institution, private donor (commercial? not-for-profit?), other (please specify) | For how long would this income stream sustain the service/component after EOSC Beyond? | Expected amount of income per month/year from this source (€) | What risks do you believe are associated with this income stream? |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| **<Exploitation path 4>** | | | | | |
| etc… | | | | | |

# Appendix D - Audience Survey, EGI Conference Session

## Summary of results gathered

The EOSC Beyond sustainability work was presented at the **EGI 2025 conference** in Santander, Spain in June 2025. The **presentation** was part of the "Services and Technologies for EOSC" session, and involved a short presentation summarising the work including two specific examples of services, and the findings to date. In parallel, the audience was invited to complete a short online survey. The information collected by the survey was then run through with the audience, with further comments invited from the floor. This format allowed interesting information to be collected. The survey is reported in full in Appendix C but is summarised below.

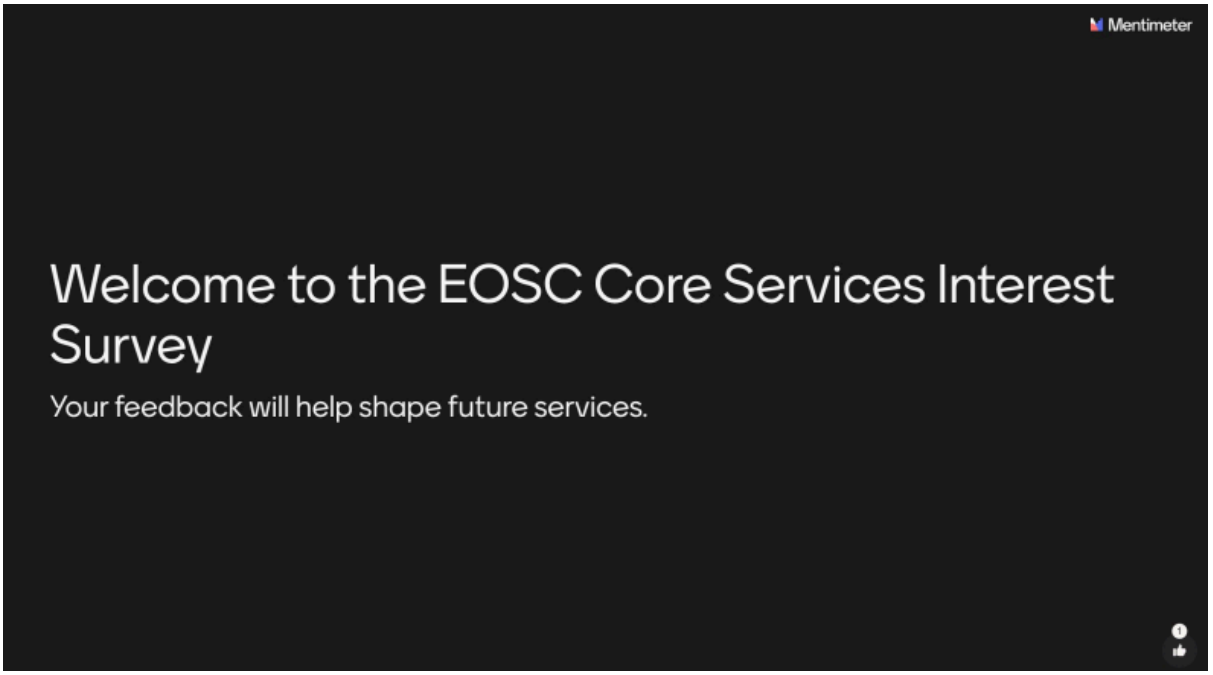
Around 70% of the survey respondents expressed their interest in using EOSC Core Services in future, with a further 10% or so unsure. No respondents said they would not be interested in using the services. The services of greatest interest were the Catalogue and Marketplace, followed by the Execution Framework and AAI, and then Accounting, Monitoring and the Helpdesk. Service usage was mainly envisaged for supporting projects, but also for service deployment, use cases, integration with scientific workflows and in connection with building nodes in the EOSC Federation. Nearly 60% of the respondents felt the preferred option for paying for usage of EOSC Core Services was EU funding; around a sixth of the audience felt project budgets should pay, and a similar proportion favoured use of national-level funding. The survey also asked, if services were to be paid for using credits, who the credits should be allocated to. Answers were divided between a researcher's organisation and the individual researcher, with a smaller number opting for service providers.

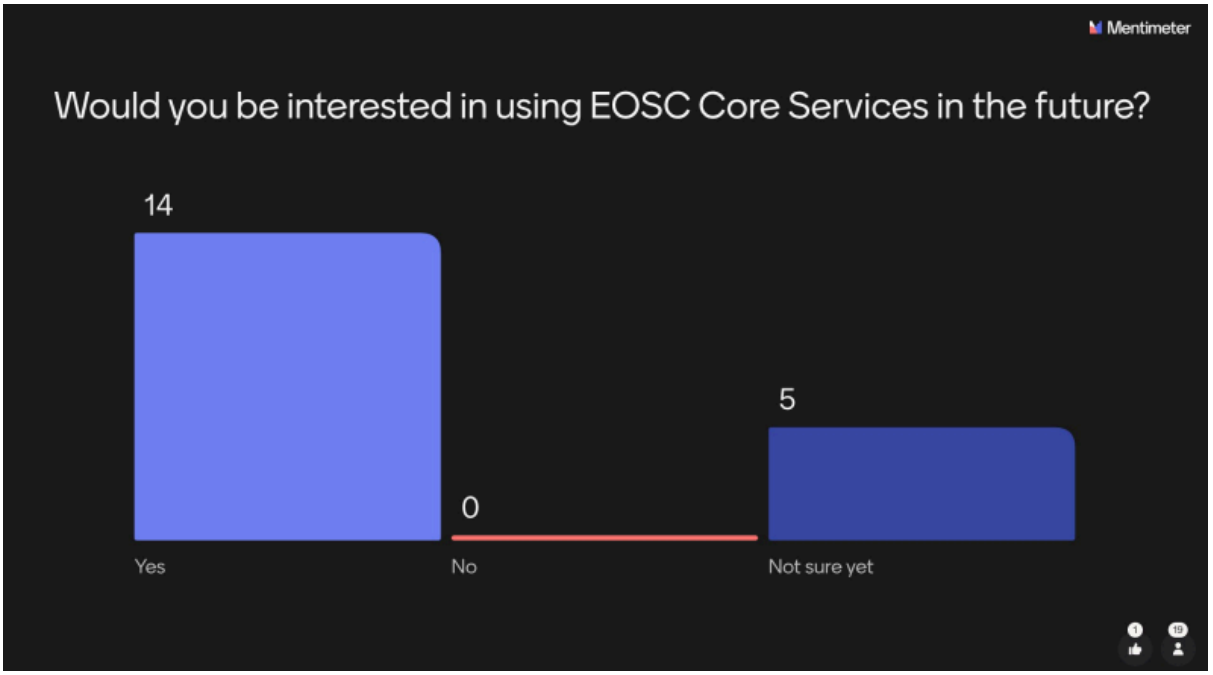
Suggested improvements to the Core Services were greater accessibility, delivery as-a-service, and implementation support.

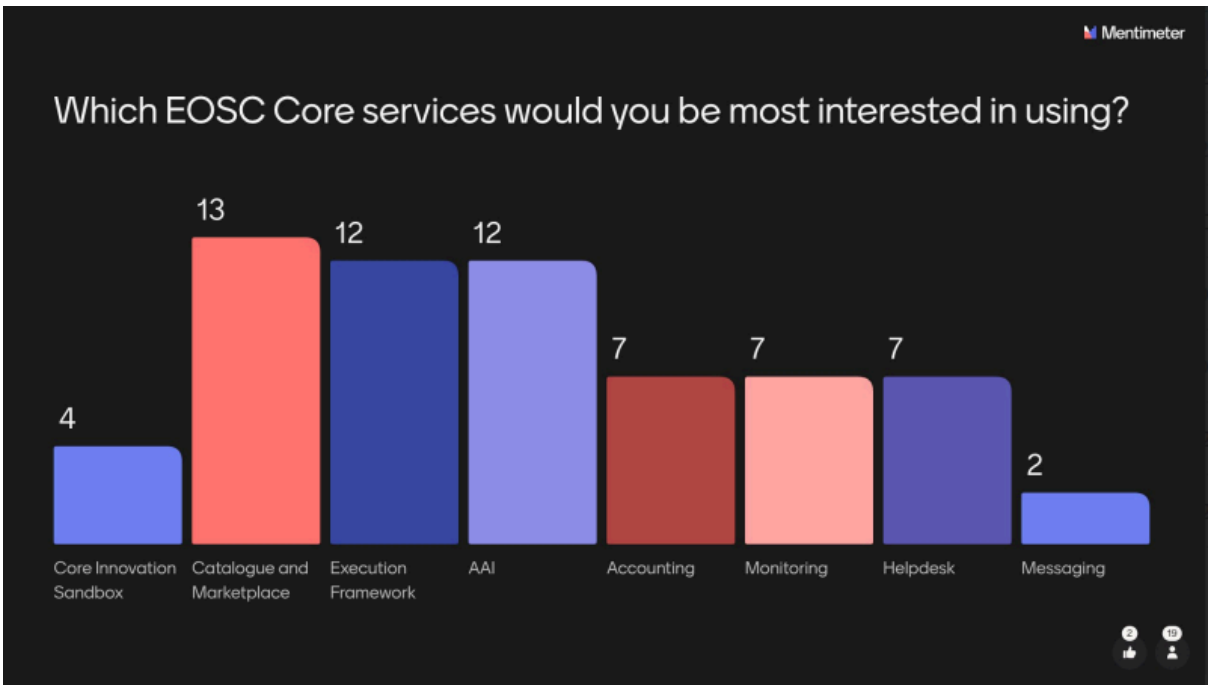
All respondents said they may or would be interested in using EOSC Core Services outside the EOSC framework - an encouraging indication of potential future interest in using the Core Services - with the Catalogue, AAI, Monitoring and Accounting all mentioned specifically.

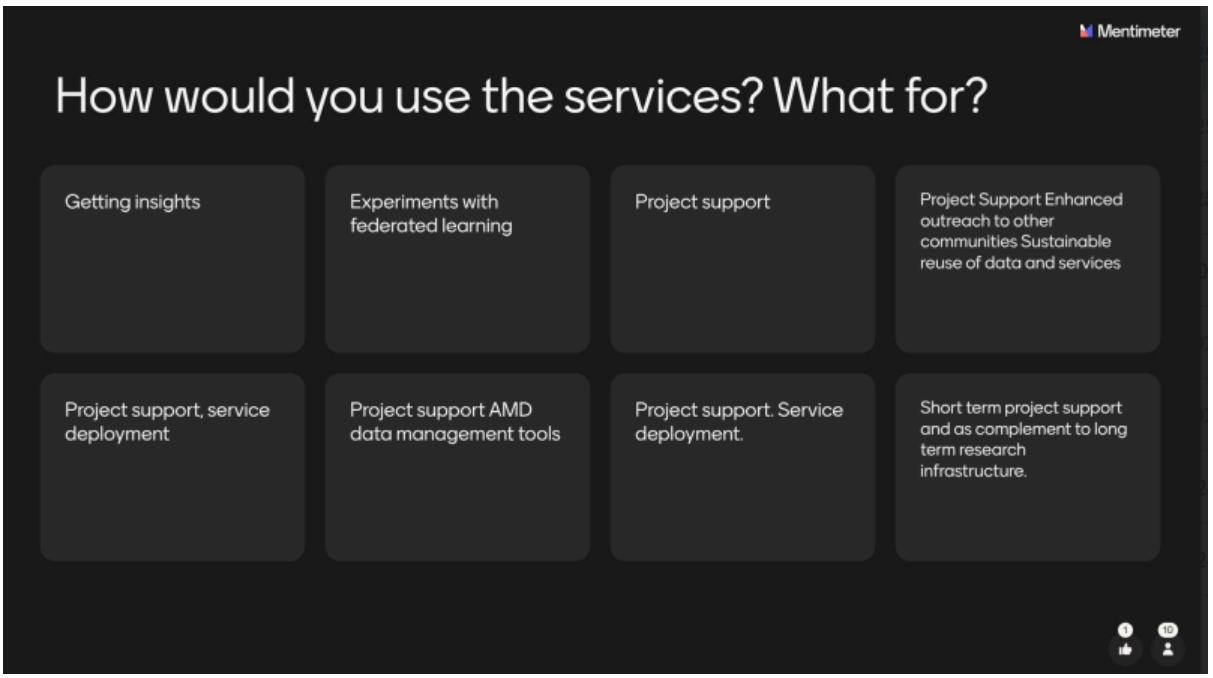
Finally, the audience were asked for their tips relating to service sustainability. One respondent advised to think early on whether the costs of providing a service justify the effort required, and how they increase with scale; another counselled to make things which people like and will use; a third advised care in selecting the right service model, recognising that the customer (who pays) and the user are likely to be different.

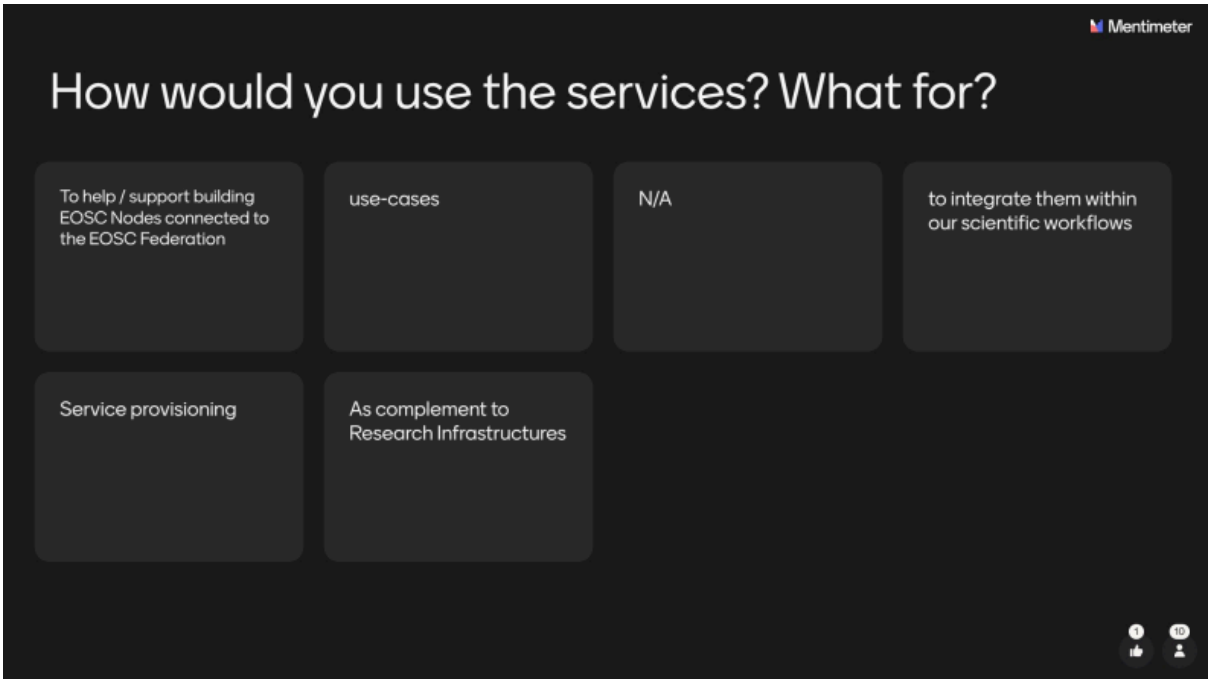
## EGI Conference session survey

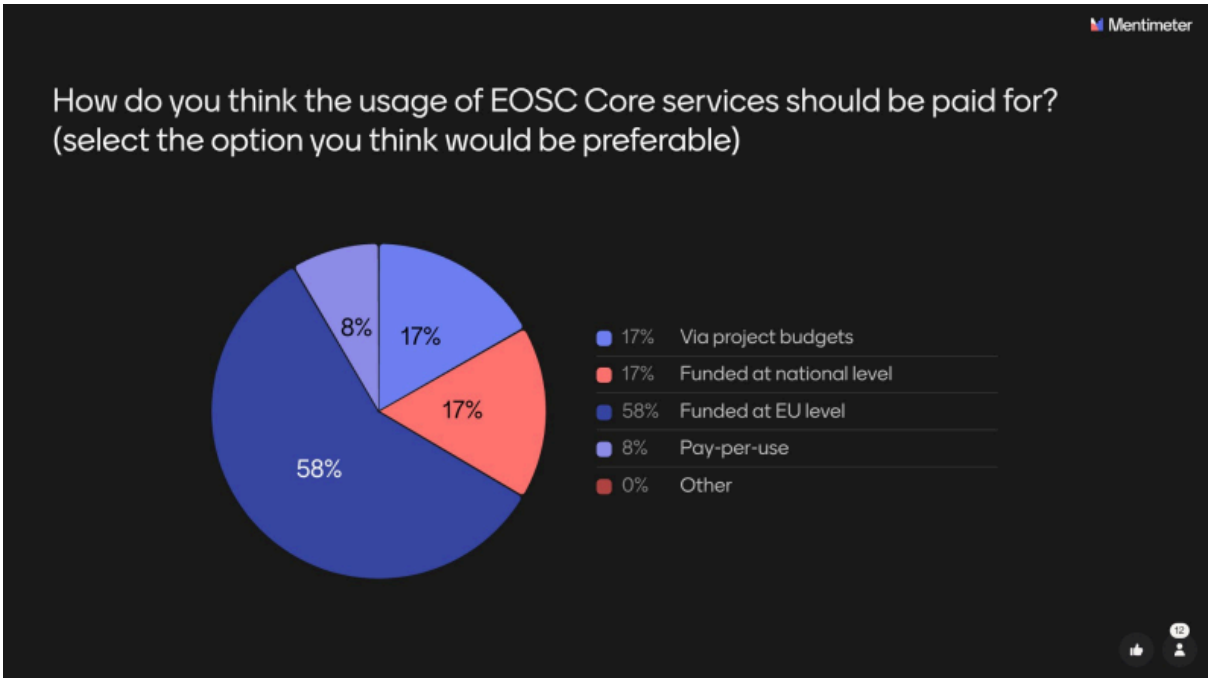


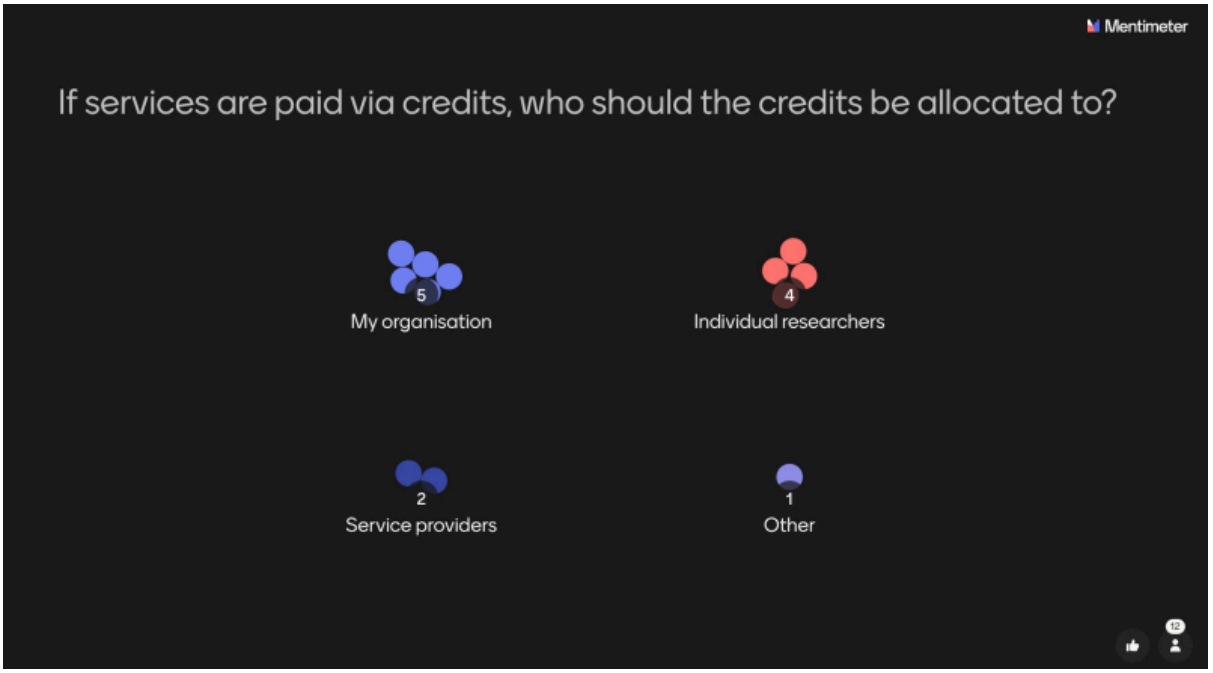



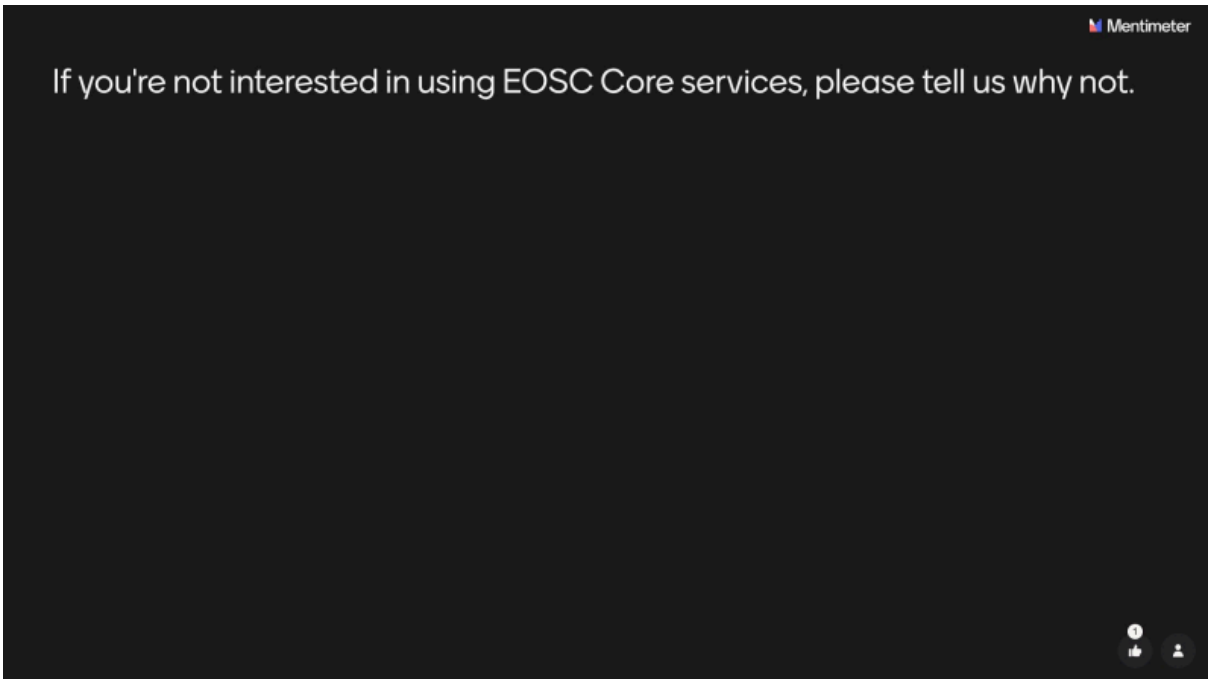

Mentimeter
Which EOSC Core services would you be most interested in using?
4
13
12
12
7
7
7
2
Core Innovation Sandbox
Catalogue and Marketplace
Execution Framework
AAI
Accounting
Monitoring
Helpdesk
Messaging

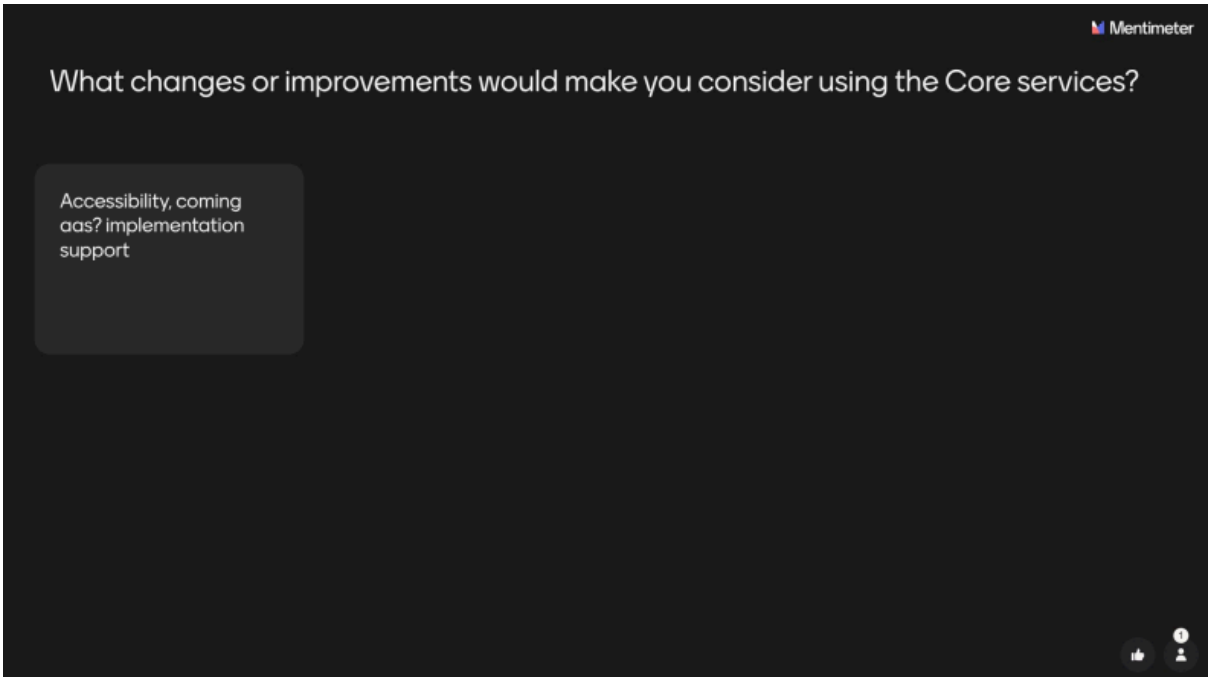

Mentimeter
How would you use the services? What for?
Getting insights
Experiments with federated learning
Project support
Project Support Enhanced outreach to other communities Sustainable reuse of data and services
Project support, service deployment
Project support AMD data management tools
Project support. Service deployment.
Short term project support and as complement to long term research infrastructure.

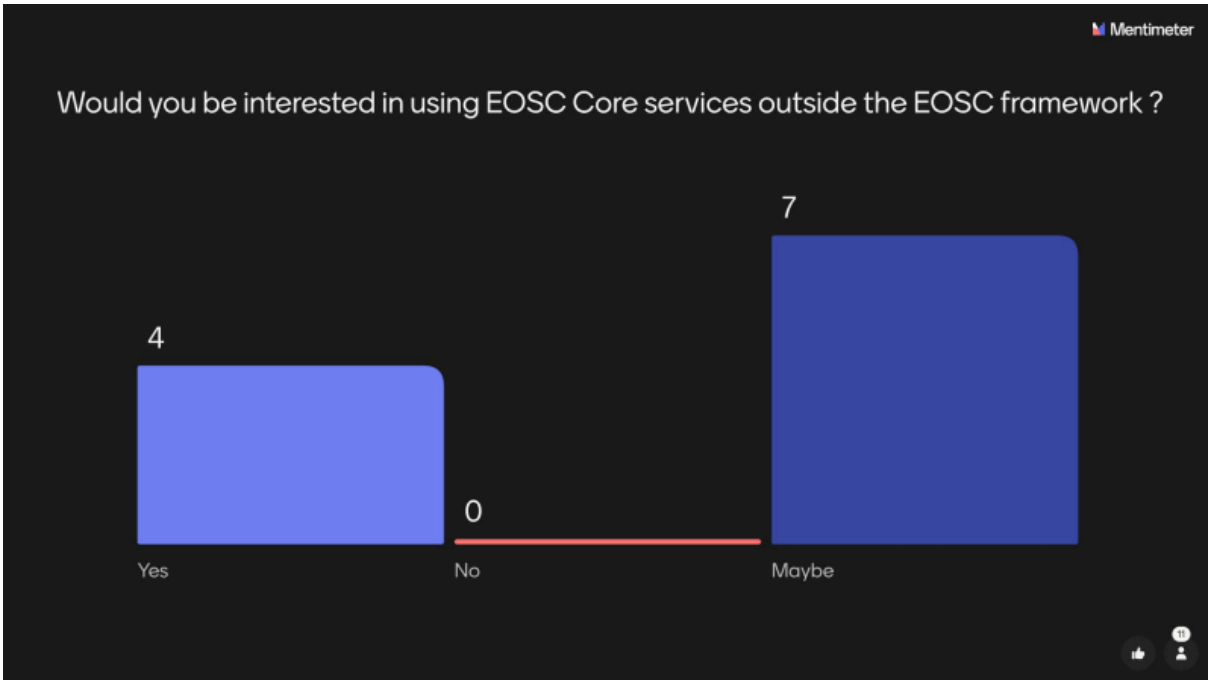

Mentimeter
How would you use the services? What for?
To help / support building EOSC Nodes connected to the EOSC Federation
use-cases
N/A
to integrate them within our scientific workflows
Service provisioning
As complement to Research Infrastructures

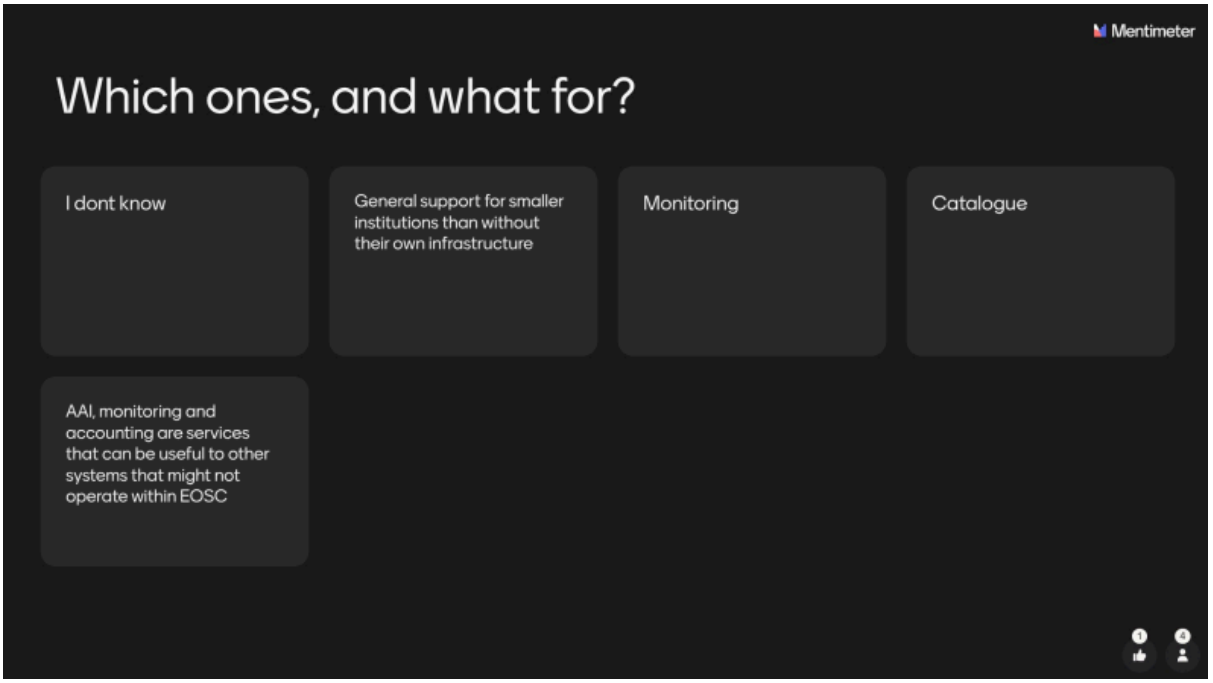

Mentimeter
How do you think the usage of EOSC Core services should be paid for? (select the option you think would be preferable)
8%
17%
17%
58%
17% Via project budgets
17% Funded at national level
58% Funded at EU level
8% Pay-per-use
0% Other


Mentimeter
If services are paid via credits, who should the credits be allocated to?
5
My organisation
4
Individual researchers
2
Service providers
1
Other


Mentimeter
If you're not interested in using EOSC Core services, please tell us why not.


Mentimeter
What changes or improvements would make you consider using the Core services?
Accessibility, coming aas? implementation support


Mentimeter
Would you be interested in using EOSC Core services outside the EOSC framework ?
4
0
7
Yes
No
Maybe


Mentimeter
Which ones, and what for?
I dont know
General support for smaller institutions than without their own infrastructure
Monitoring
Catalogue
AAI, monitoring and accounting are services that can be useful to other systems that might not operate within EOSC

# Acronyms

| Term | Definition |
|---|---|
| EB Core Services | EOSC Beyond Core Services |
| EOSC | European Open Science Cloud |
| EOSC-A | EOSC Association |
| EB Core Services | Core services being developed by EOSC Beyond |
| GDPR | General Data Protection Regulation of the EU: see https://commission.europa.eu/law/law-topic/data-protection_en |
| Intellectual Property (IP) | Unique, value-adding creations of the human intellect that result from human ingenuity, creativity and inventiveness.<br>source: ISO 56005:2020 |
| N/A | Not applicable |
| pa | Per annum |
| Research Infrastructures (RIs) | Facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields.<br>source: EC Research Infrastructures |
| RDH | Resource Discovery Hub |
| SLA | Service Level Agreement |
| SMS | Service Management System: a set of software, processes, and activities which help manage and deliver services. |
| TCB | Technical Coordination Board |
| WP | Work Package |
| WP7 | Design the next generation of EOSC Core services |
| WP10 | Design of the EOSC Integration Suite and Execution Framework |
| WP15 | Co-design and initial integration of EOSC Nodes and Data Spaces |
| WPLG | Work Package Leader Group at EOSC Beyond |