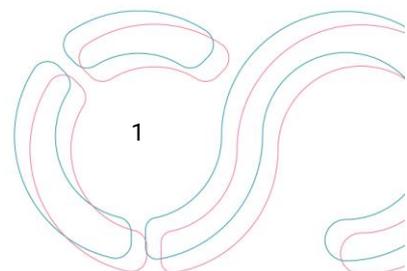# Financial Sustainability Task Force

Statement on Funding EOSC
November 2023

EOSC Association AISBL

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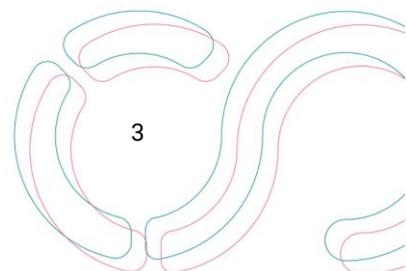
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1. Introduction

The EOSC governance bodies are considering the future legal entity/ies and governance structures which may be adopted for EOSC from 2027. The EOSC Association's Financial Sustainability Task Force wishes to provide its most relevant conclusions to these considerations through this short statement, which specifies requirements of the future EOSC legal entity, makes eight recommendations for the funding of EOSC which underpin our proposals, and presents estimates of the possible future costs of EOSC.

2. Specific Requirements for the EOSC Legal Entity from the Perspective of Financial Sustainability

The Task Force has identified in the table below, a number of requirements against which legal models under consideration for the future EOSC legal entity should be assessed.

Requirement for legal entity	Justification
The legal entity has a long term sustainable time horizon	Longevity of the EOSC governance and operating environment (10 years or more) is essential to provide sufficient assurance to users and providers, of the stability and sustainability of EOSC so they are willing to rely on and integrate with EOSC
Member States (MS) & Associated Countries (AC) are present in governance as stakeholders making a long-term financial commitment	When MS & AC commit and have a financial stake in EOSC, they will be motivated to ensure nationally relevant sound strategic direction and implementation of their investment
Different legal forms of research entities (e.g. ERICs, European Intergovernmental Research Organisations), can participate appropriately	Due to their significance in the European research landscape, such organisations should have the ability to contribute to and benefit from EOSC activities and strategic discussions, but not all forms of legal entity support this
The community of stakeholders can exercise influence within the legal entity over the EOSC work programme, including the selection of centrally financed services	The most sustainable EOSC is an EOSC that is actively used; users and service providers need a voice in the governance to ensure EOSC is fit-for-purpose

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Research performing and public sector organisations can use services from the EOSC marketplace without going through a public procurement	A suitable choice of legal entity for EOSC could avoid the requirement for public procurement by service-consuming organisations, realising significant economies of effort and cost to cross-border and cross-discipline service sharing
There is a means to avoid paying VAT when users purchase services through the EOSC Exchange	A suitable choice of legal entity for EOSC can avoid VAT barriers and costs for cross-border and cross-discipline service sharing, supporting the creation of a well-functioning marketplace
Potential participation of private companies as users of EOSC is possible	Anticipating extension of the EOSC user base to industry and commerce, private companies should be able to benefit from EOSC

Table 1: Legal Entity Requirements from the Perspective of Financial Sustainability

3. Recommendations for Funding EOSC

1. **Joint funding by the EC and Member States/Associated Countries of the collective EOSC components (Core and support, centrally financed EOSC Exchange services, EU-level data federation components) is essential to ensure real engagement of MS/AC in EOSC at European level.** Funding should be in cash, not in-kind, to provide assurance of income, strong national engagement in securing strategic relevance, and quality control.

2. **Long-term, stable political and financial commitment (at least 10 years) from the EC and the EU Member States and Associated Countries is essential** to ensure users and infrastructures can rely on, and are willing to integrate with, the EOSC infrastructure. For EOSC to become a success it needs both content and usage.

3. **EOSC should build on, complement and enhance the landscape.** EOSC is part of the rich ecosystem of research infrastructures at local, national and European levels which has been created by investment by the MS and AC, and the EC, over many years. EOSC has an important role to play in ensuring the maximum value is derived from investments already made (e.g. in the research infrastructure cluster projects).

4. **The EOSC Exchange needs to provide straightforward access to the European research community's services and platforms for data utilisation and analytics**, to support realisation of the full potential of research data. This requires viable cross-border cost recovery (remuneration) mechanisms, evolving mandates of existing RIs and (national) eInfrastructures and ensuring procurement-free service consumption. Any centrally financed components need to have user-driven selection and governance to ensure they match the needs of the users.
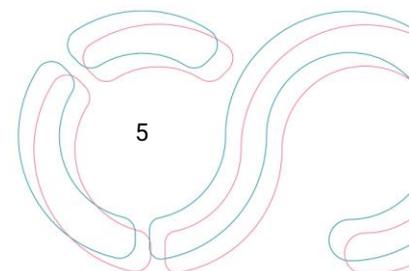
5. **Federating data and services through EOSC involves additional costs for providers, which should be identified with RIs and e-Infrastructures and paid for by Member States/Associated Countries**. The benefits of federation may not be realised directly by those bearing the cost - (primary) data producers vs. (secondary) data consumers - or else may take considerable time to accrue (economies of scale for service providers).

6. **Coordination of EOSC strategy and funding between Member States and with the EC, is required and should be assured as part of the EOSC governance.** The example provided by ESFRI could be followed. EOSC is a federated infrastructure whose content and users come from its participating entities. The activities of hundreds, if not thousands, of organisations need to collectively contribute to a thriving and rich EOSC. Investments in coordination at cross-disciplinary, national and European levels (e.g. EOSC Association, thematic clusters) should be leveraged and maintained, as the "human factor" - building networks and common understanding - takes time. Increased MS investment in and commitment to combined European (i.e. cross-border) activities, rather than those with [effectively] only a national scope, is required, in order to fully realise the benefits of EOSC for the Open Science agenda.

7. **The sustainability of services must be addressed for efficient use of investment.** At present, the development of scientific services heavily depends on short-term EC project funding but the committed longer-term support for their stable operation and maintenance often does not materialise. This results in services whose income does not scale with usage (and cost), and which are too short-lived to encourage researchers to rely on them. This problem needs to be addressed by Member States and the EC as part of wider research strategy and planning.

8. **Inclusiveness**: Whatever legal and governance model is adopted, the division of costs within its funding model should not act as a barrier for countries to participate: the costs should be shared in such a way that all Member States and Associated Countries can afford to be part of the governance.

4. Required funding from 2027

Table 2 below summarises some estimates from the Task Force of the required funding for Tasks 1-4[1], proposed in an attempt to help the discussion of the future funding and governance of EOSC. However, considerable guesswork is involved in interpretation of the five tasks in the table: the architecture of the data federation is undefined, the EOSC nodes concept introduces uncertainty as to architecture and related costs, and the contents of the portfolio of centrally financed services is not defined, all of which create uncertainty about the size and scope of

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[1] The table is based on a slide ("Helicopter View") from DG RTD which defines Tasks 1-5. The Task Force has added the Required Funding and Funding Sources columns and the information in them
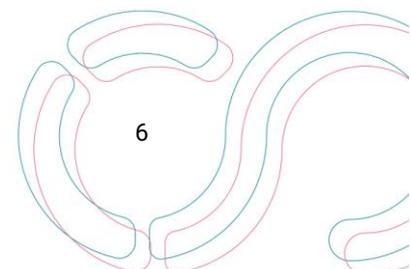
the EOSC Core; the EC procurement provides some of the few concrete numbers available, but its scope and scale have yet to be tested in practice; and our estimates have not been able to draw on a detailed analysis of the research landscape. The funding of EOSC is a very complex topic, and our proposals should be used only as an indication of the order of magnitude of the future costs involved.

The EC Procurement[2] of the **EOSC Core and elements of the EOSC Exchange** - which we interpret as being represented by Task 1 in Table 2 below as the "EOSC EU node", or "minimum viable EOSC" - for the period 2024-2026 has a total budget of €32 million, equivalent to approximately €11 million per year. Fifty percent of this amount is dedicated to EOSC Core services. The other half of this money is provided for data analytics and storage services. The Task Force interprets this as an experiment in the provision of a selective service portfolio of centrally financed services (horizontal and thematic)"[3].

Whilst the Core should remain lean, allowance should be made for costs to increase to meet increased usage demands, e.g. for services such as AAI whose costs increase with usage but at a relatively low rate. It should be considered however that **European-level data federation** will incur costs at the EU level, although it is difficult to predict an amount since the architecture is still unclear, and the scope and cost of the EOSC nodes concept have not yet been defined. Activities such as support and training, usage monitoring, service selection and quality assurance, Rules of Participation and access policy enforcement and evolution, and regulatory compliance also need to be funded.

On the other hand, the costs for **centrally financed services** may grow with their usage, and are hard to predict as they depend on the type and scope of these services; a collaboration suite for 1 million researchers has a different price tag than providing a relatively small pool of European-level compute services for cross-border use cases. A conservative proposal would be to make provision of at least €10 million per annum[4] - a doubling of the amount in the EC EOSC procurement - for centrally financed services as part of Task 1 for several years (portfolio determined by a user driven governance), whilst a harmonised European approach is developed to smooth service provisioning and consumption via the EOSC Exchange, as well as a good understanding of how much service consumption needs to be collectively funded to support effective use and reuse of research data.

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[2] See https://etendering.ted.europa.eu/cft/cft-display.html?cftId=12087 and https://ted.europa.eu/udl?uri=TED:NOTICE:709092-2022:TEXT:EN:HTML&rearus=T8JZ3mFZXCS_FfJlRvGxKg

[3] The concept of such a portfolio was discussed, but its contents not defined, by the Task Force in our November 2022 progress report "Towards Sustainable Funding Models for the European Open Science Cloud", https://zenodo.org/records/7318481

[4] One comparison is provided by the EGI-ACE project, which served 43 use cases with compute and analytics services, with a budget of €4.8 million per year. See the EGI-ACE Impact Report at https://zenodo.org/records/8119614
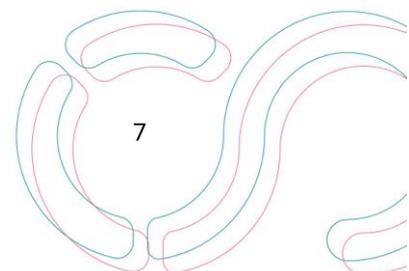
We assume Task 2 in the table above to include staffing and running costs of the future EOSC legal entity, as well as costs relating to coordinating and developing the nodes concept[5].

Given these uncertainties, the Task Force feels unable to propose figures with any accuracy, but to provide an idea of order of magnitude, we estimate that Tasks 1, 2 and 4 taken together may require funding of between €10M and €50M per year.

The biggest cost factor concerns efforts for **making data and services FAIR and ensuring their integration with EOSC**, which the Task Force understands to broadly map to Task 3 of Table 2. Already back in 2016, the first EOSC High-level Expert Group observed that about 5% of research expenditure should be spent on properly managing and stewarding data[6], and the Knowledge Exchange Research Data Expert Group and Science Europe Working Group on Research Data recommended a 5% "data overhead" as an additional budget for an individual RPO[7]. Additionally, for its 2016 Roadmap, ESFRI recommended as much as 15-20% of the investments to go into the e-infrastructure[8]. This is a cost each RI and institution needs to bear via its normal funding channels. (We assume costs relating to the EOSC Interoperability Framework are part of Task 1.) The Task Force has provided a cost estimate for RIs in table 2, but this is based on experience from one RI, EPOS[9], and is likely to underestimate the total because the costs for institutions (RPOs) are not included, so the estimate should be used only as an indicator of the order of magnitude of the expected costs.

The estimated costs in table 2 should be considered against the estimated cost for the EU economy of *not* having FAIR data, estimated to be at least Eur10.2bn per year, and possibly as much as Eur26bn per year[10].

Overall, it may be observed from the suggested amounts in Table 2, that the costs of the operation, maintenance and development of the minimum viable EOSC in Tasks 1 and 4, and the expansion of the EOSC federation in Task 2, are very modest in relation to the overall estimated cost of FAIRification, represented at least in part by the figures in Task 3. And yet, to achieve the full potential of that FAIRification, the minimal viable EOSC is required: it provides the federating "glue" which ensures realisation of the value of the investment by MS in Open Science.

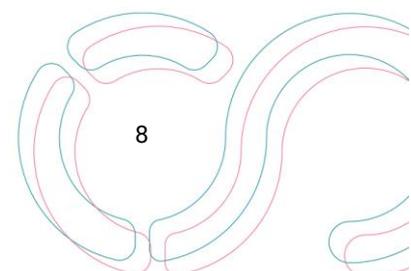[5] A draft position paper of the EOSC Association Board was published for comments in October 2023

[6] "Realising the European Open Science Cloud", https://op.europa.eu/en/publication-detail/-/publication/2ec2eced-9ac5-11e6-868c-01aa75ed71a1. See implementation recommendation I5

[7] Science Europe: Funding research data management and related infrastructures, May 2016. Accessible at: se-ke_briefing_paper_funding_rdm.pdf (scienceeurope.org). See page 23.

[8] Supporting the transformative impact of research infrastructures on European research, independent expert report for DG RTD, 2020, accessible at https://bit.ly/Impact-of-research-infrastructures-on-EU-research. See page 51.

[9] https://www.epos-eu.org/. EPOS was chosen on the basis of its mission and services offered, at a smaller scale but similar to what is envisaged for EOSC

[10] Cost benefit analysis for FAIR research data conducted by PwC on behalf of the EC's DG RTD, March 2018. Accessible at https://bit.ly/Cost-benefit-analysis-of-FAIR-data

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Main EOSC Tasks for the Future (2027 onwards)	Estimated required Funding	Funding Sources
Task 1: Deploying and operating the EOSC EU node (Core, Exchange, FAIR Data Federation)	See estimate for Tasks 1, 2 and 4 in text above	MS/AC and European Commission (EC)
Task 2: Maintaining and updating the EOSC EU node and expanding the EOSC federation (with elements that are close to the 'market')	See estimate for Tasks 1, 2 and 4 in text above	MS/AC and EC
Task 3: Enabling a 'web of FAIR data and service' for science		MS/AC: coordinated national initiatives; and EC
Creating the data infrastructures and processes necessary to provide FAIR and open data	One-off investment of 10% of the investment already made in the RIs and infrastructures generating the data	National, regional, institutional (usual scheme funding the RI that provides the data), EC
Operating the data infrastructures and processes necessary to maintain FAIR and open data	Annual investment of 10% of the previous line - i.e. 1% investment per annum	National, regional, institutional (usual scheme funding the RI that provides the data).
Continuous development and upgrade of the data infrastructures and processes necessary to provide FAIR and open data	An increase of 33% in the annual operating costs of data-producing RIs and infrastructures	National, regional, institutional (usual scheme funding the RI that provides the data), EC
Task 4: Develop, prototype and test new elements supporting the evolution of the EOSC Core and Exchange and the tools enabling the federation (focus on elements that can be made ready for the 'market')	See estimate for Tasks 1, 2 and 4 in text above	Future EC Framework Programme (FP)
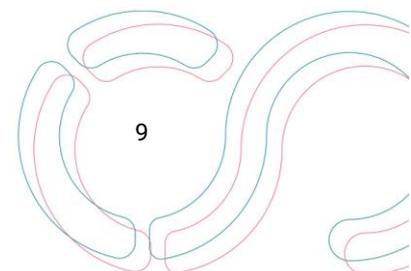
Task 5: Enabling Open Science policies and the uptake of Open Science practices		Future EC FP / national initiatives

Table 2: "Helicopter View" table with proposed funding requirements added