

## D2.10: Mechanisms to align national investments relevant to the objectives of the EOSC

Author(s)	Volker Beckmann (CNRS)
Status	Final
Version	V1.3
Date	31/03/2019

### Dissemination Level

- |                                     |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | PU: Public   |
| <input type="checkbox"/>            | PP: Restricted to other program participants (including the Commission)          |
| <input type="checkbox"/>            | RE: Restricted to a group specified by the consortium (including the Commission) |
| <input type="checkbox"/>            | CO: Confidential, only for members of the consortium (including the Commission)  |

### Abstract

The success of the EOSC will heavily rely on the simultaneous evolution of services, e-infrastructures, policies, governance and funding models on the national and on the European level. Mechanisms have to be identified that allow the alignment of investments of funding agencies (and member states, in general) with the long-term objectives and goals of the EOSC.

Based on extensive interaction with both funding agencies and research-supporting ministries, this document describes opportunities and challenges in this process from national perspectives.

The results can be summarized in the VICIOUS approach: for the funders to be able to commit to the EOSC, their participation has to be Visible, Incentives have to be present, Control over national services and e-infrastructures has to be maintained by the funders, Identified Objectives need to be clearly stated for the EOSC initiative, Uptake of national services to the international level is key, and Sustainability is one of the main concerns of funders.

Many of these VICIOUS aspects can be tackled through better information flows between the European Commission, ministries, and funding agencies.

The European Open Science Cloud for Research pilot project (EOSCpilot) is funded by the European Commission, DG Research & Innovation under contract no. 739563

<b>Document identifier: EOSCpilot –WP2-D2.10</b>	
Deliverable lead	<b>CNRS</b>
Related work package	<b>WP2</b>
Author(s)	<b>Volker Beckmann (CNRS)</b>
Contributor(s)	<b>Juan Bicarregui (STFC)</b>
Due date	<b>31/03/2019</b>
Actual submission date	<b>31/03/2019</b>
Reviewed by	<b>Dale Robertson (JISC), Nadia Tonello (BSC-CNS), Oriol Pineda (BSC-CNS)</b>
Approved by	<b>Mark Thorley (UKRI)</b>
Start date of Project	<b>01/01/2017</b>
Duration	<b>28 months</b>

## Versioning and contribution history

<b>Version</b>	<b>Date</b>	<b>Authors</b>	<b>Notes</b>
<b>0.1</b>	01/03/2019	Volker Beckmann (CNRS)	First version
<b>1.0</b>	14/03/2019	Volker Beckmann (CNRS)	Version 1.0 ready for reviewing
<b>1.1</b>	19/03/2019	Volker Beckmann (CNRS)	Update following comments by Dale Robertson
<b>1.2</b>	20/03/2019	Volker Beckmann (CNRS)	Update following comments by Nadia Tonello and Oriol Pineda (BSC-CNS)
<b>1.3</b>	31/03/2019	Mark Thorley (UKRI)	Final typographic proof-read and edit

## TABLE OF CONTENT

<b>EXECUTIVE SUMMARY .....</b>	<b>4</b>
<b>1 INTRODUCTION .....</b>	<b>5</b>
<b>2 DERIVING INPUT.....</b>	<b>6</b>
2.1 Context .....	6
2.2 Approach .....	6
<b>3 RESULTS .....</b>	<b>7</b>
3.1 Visibility .....	7
3.2 Incentives.....	7
3.3 Control.....	9
3.4 Identified Objectives.....	9
3.5 Uptake .....	10
3.6 Sustainability .....	11
<b>4 CONCLUSION .....</b>	<b>13</b>

## LIST OF FIGURES

Figure 1: To align national investments to the EOsc, these contributions have to be explicitly credited .....	7
Figure 2: Incentives to join the EOsc and EOsc-readiness is often anti-correlated. ....	8
Figure 3: Incentives have to be communicated to the national actors in order to facilitate their decision to align investments with the EOsc.....	9
Figure 4: National investments have to stay under the control of national entities. ....	9
Figure 5: The fact that the EOsc is an evolving system can make it difficult to engage. Here, information flow to and from the EOsc towards funding agencies and ministries is key. ....	10
Figure 6: Uptake of regional/national services and solutions to the European level is a key aspect. ....	11
Figure 7: Long-term sustainability requires discussions of the European Commission with ministries and funding agencies at the same time. ....	12
Figure 8: The expected contributions from national enablers are balanced by VICIOUS expectations towards the EOsc .....	13

**Copyright notice:** This work is licensed under the Creative Commons CC-BY 4.0 license. To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0>.

**Disclaimer:** The content of the document herein is the sole responsibility of the publishers and it does not necessarily represent the views expressed by the European Commission or its services.

While the information contained in the document is believed to be accurate, the author(s) or any other participant in the EOscpilot Consortium make no warranty of any kind with regard to this material including, but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Neither the EOscpilot Consortium nor any of its members, their officers, employees or agents shall be responsible or liable in negligence or otherwise howsoever in respect of any inaccuracy or omission herein.

Without derogating from the generality of the foregoing neither the EOscpilot Consortium nor any of its members, their officers, employees or agents shall be liable for any direct or indirect or consequential loss or damage caused by or arising from any information advice or inaccuracy or omission herein.

## EXECUTIVE SUMMARY

The European Open Science Cloud will rely on national investments relevant to the objectives of the EOsc. The main actors in this context are the relevant ministries in the member states, and the funding agencies supporting the entities that contribute to the EOsc through service and e-infrastructure provision.

A range of perceived risks and opportunities are present on the national level. The main points can be summarized in the VICIOUS (Visibility, Incentives, Control, Identified Objectives, Uptake, Sustainability) aspects:

- **Visibility:** Contributions to the EOsc have to be clearly given credit to. Often, these contributions are not directly visible because they are provided through higher-level portals. **Recommendation:** Credit explicitly underlying contributions in the EOsc Portal and in other EOsc related activities.
- **Incentives:** EOsc-readiness and need for EOsc-type services are often reverse-correlated. The EOsc needs the expertise and participation of EOsc-ready research communities, which may have less incentive to participate in the EOsc. **Recommendation:** Ensure incentives for both EOsc-ready and EOsc-far communities for joining the EOsc. Ensure information flow towards ministries, funding agencies and research communities about the incentives in aligning investment with the EOsc.
- **Control:** Contributors need to stay in charge of the modalities of their contributions. **Recommendation:** Reassure the contributors of the system-of-systems nature of the EOsc and that national investments stay under the control of national entities.
- **Identified Objectives:** Once the main aspects of the EOsc, such as rules of participation, governance structure, business model, etc. are fully defined, it will be more straightforward for funding agencies to commit to the EOsc. **Recommendation:** Involve funding agencies more strongly in the shaping of the EOsc. Ensure information flow towards funding agencies about the status of the EOsc as it evolves.
- **Uptake:** The EOsc can help to support required restructuring efforts on the national level. **Recommendation:** Support the uptake of services and solutions from the regional/national to the European level through further dedicated H2020 and Horizon-Europe calls.
- **Sustainability:** With no sustainable business model for the EOsc adopted so far, there is a perceived financial risk through a commitment to the EOsc, both from the ministries and from the funding agencies. **Recommendation:** Stimulate face-to-face discussions on the business model bringing together the Commission, relevant ministries and funding agencies.

As can be seen in these recommendations, the situation can be significantly improved by stimulating better information flow between the partners involved in shaping the EOsc. Another important aspect is to give all stakeholders sufficient influence in the decision making body of the EOsc. In the context of the alignment of national investments with the EOsc, this is especially important for the funding agencies.

## 1 INTRODUCTION

The objectives of this deliverable are to provide valuable input into the discussion process on how to enable funding agencies and ministries in the EU member states to commit resources in a way that these investments are aligned with the objectives of the European Open Science Cloud (EOSC).

The EOSC is an evolving vision that requires participation by the main stakeholders in Europe to enable this vision to become reality. Besides the scientific communities, which are probably the main actors here because they represent not only the users but also the providers of data and services to be shared in the EOSC, an important role lies with those entities that are to finance the backbone of the services and e-infrastructures. Funding agencies and related ministries are under a high pressure to invest in those activities that provide the best return – either in terms of scientific return, but also in terms of visibility, gain in influence on different levels, and political gain. Thus, enabling investments relevant for the EOSC is a complex process.

This document aims to highlight the difficulties and opportunities for the relevant partners to engage investments in this context. The approach excludes technical challenges, which are discussed elsewhere, e.g. in deliverable D6.8 concerning the infrastructure interoperability challenges<sup>1</sup> or in D6.9 with respect to FAIR data interoperability<sup>2</sup> in the EOSC.

The listed challenges and opportunities are by no means a complete list of issues relevant in this context. The aim was rather to point out aspects that might have been missed in discussions and documents on this topic. We hope that the deliverable in turn will stimulate the on-going discussion on how to achieve a valuable, functioning, and persistent EOSC system within the very near future, and is also meant as an input for the EOSC working groups and EOSC Executive Board.

---

<sup>1</sup> See <https://www.eoscpilot.eu/content/d68-final-eosc-architecture>

<sup>2</sup> See <https://www.eoscpilot.eu/content/d69-final-report-data-interoperability>

## 2 DERIVING INPUT

The work to discuss with the relevant partners, like ministries and funding agencies, the possibility to align national investments to support the creation of the EOsc ecosystem, is done in the context of WP2, which provides solutions and recommendations for the governance aspect of the EOsc. More specifically, this deliverable is part of the work on Task 2.4 (Leverage of Member States investment) and closely linked to the “EOsc Summit”. Originally it had been foreseen that the EOscpilot would coordinate and organize these summits. However, in the end, these were directly organized by the European Commission. Although the EOscpilot project partners actively participated in the EOsc Summits of 2017 and 2018, we were not involved directly in the discussions between member states and the EC about possible funding mechanisms of the EOsc.

### 2.1 Context

The general approach, regarding how to get all relevant stakeholders involved in the building of the EOsc has been discussed e.g. in the reports and recommendation of the First<sup>3</sup> and Second<sup>4</sup> High Level Expert Group on the European Open Science Cloud. A number of research infrastructures and scientific communities have already signed the EOsc Declaration<sup>5</sup>, indicating their willingness to actively participate in the EOsc.

EOsc-pilot project members engaged in a large number of discussions concerning the opportunities and challenges in the alignment of national and EC funding instruments to enable and empower the EOsc. These were done on the national and international level, with members of ministries and colleagues representing funding agencies, with larger service and e-infrastructure providers, and also with ESFRI representatives. It soon became clear that, although discussions were lively and a strong interest was apparent on all sides to participate in this type of discussion, the EOsc-pilot was often not seen as the relevant partner to provide official statements to, which could be quoted in a document like this deliverable. Ministries and funding agencies were reluctant to be quoted with detailed qualitative and especially quantitative statements about their willingness to engage (or not) in the EOsc.

We therefore decided not to quote individual statements or points of view of entities. Instead we summarize in this document the perceived opportunities and challenges, which have been pointed out in these discussions. This has also the advantage that we can raise issues, which are present but might not be addressed in official statements of relevant partners.

### 2.2 Approach

The informal way allowed open discussions, which were of different length, intensity, and depth. Nevertheless, several main questions were raised in the discussions to gather information for this document:

- 1) How do you see opportunities arising from the EOsc?
- 2) Will these have a major or minor impact on the way research activities are going to be carried out in your country?
- 3) What risks do you see on your side in engaging in the EOsc?
- 4) What are possible measures to mitigate these risks?

---

<sup>3</sup> See: Realising the European Open Science Cloud, First report and recommendations of the Commission High Level Expert Group on the European Open Science Cloud, 2016.

[https://ec.europa.eu/research/openscience/pdf/realising\\_the\\_european\\_open\\_science\\_cloud\\_2016.pdf](https://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf)

<sup>4</sup> See: Prompting an EOsc in practice. Final report of the Commission 2nd High Level Expert Group on the European Open Science Cloud (EOsc), 2018. <https://publications.europa.eu/en/publication-detail/-/publication/5253a1af-ee10-11e8-b690-01aa75ed71a1>

<sup>5</sup> See: The EOsc Declaration and its principles (2017). [https://ec.europa.eu/research/openscience/pdf/eosc\\_declaration.pdf](https://ec.europa.eu/research/openscience/pdf/eosc_declaration.pdf)

### 3 RESULTS

The responses to the questions were wide-spread, but the concerns can be grouped into several categories:

- 1) The visibility of the contribution in the European context.
- 2) The need for incentives on a national level and relevant for funding agencies.
- 3) Remaining in control over the contributions.
- 4) Clearly identified and detailed objectives of the EOsc as a prerequisite to engage.
- 5) Allowing the uptake of a significant number of services to the European level.
- 6) Providing a sustainable system with clear financing schemes.

Details on each of these categories is provided below:

#### 3.1 Visibility

An important aspect for potential contributors to the EOsc is the visibility of their related activity on the European level. This can be an important incentive for participation. On the other hand, if appropriate credit to contributions is not given, this can cause funding agencies problems in ensuring support for these activities by the managing ministries, and also by the scientific communities and the laboratories involved.

Because the EOsc can be understood as a system-of-systems, often the original provider of services or e-infrastructures is hidden, because they are delivered through higher-level portals (e.g. EGI, CompBioMed Software Hub), which are then referred to in the EOsc Portal. The information, on who contributes to the creation and provision of a service, or to ensuring a reliable underlying e-infrastructure, is often not shown and requires some deeper searches. Another example is here the list of “EOsc Doers” on the EOsc Portal. Many of the important funding agencies contributing significantly to the EOsc (e.g. STFC, Helmholtz, INFN, CNRS) are not listed here, because they have, for one reason or another, not yet signed the EOsc Declaration<sup>6</sup>.

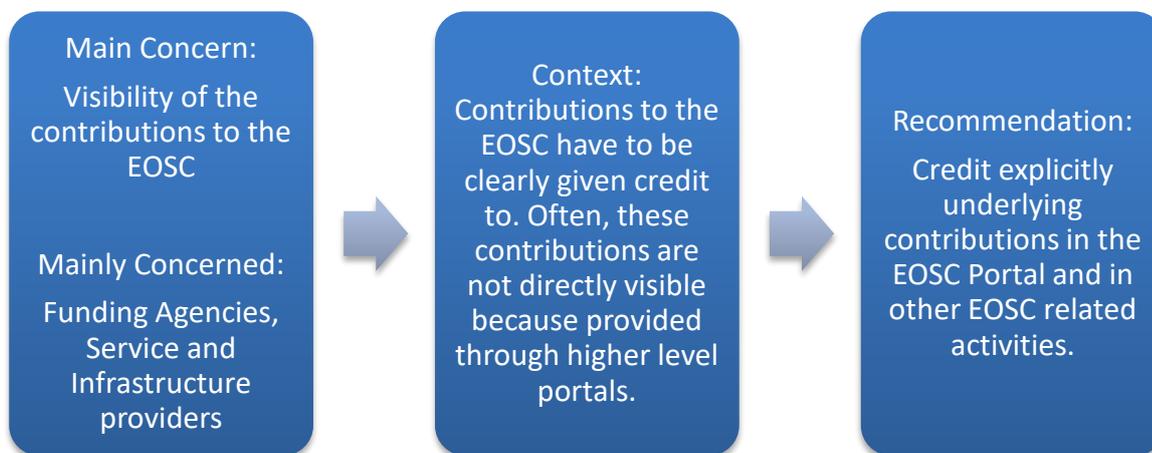


Figure 1: To align national investments to the EOsc, these contributions have to be explicitly credited

#### 3.2 Incentives

Member states and funding agencies intend to participate in the EOsc because they support the general EOsc vision. In addition, by engaging in the EOsc they expect to have significant support of their scientific communities through EOsc services and to improve the research support landscape on the national level. Especially the latter point has a high value for the member states: being able to align the evolving EOsc system and the evolution of the national infrastructures and services. Depending on the maturity and openness of the national environment, this can work both ways: the EOsc can provide models for an open

<sup>6</sup> See: The EOsc Declaration and its principles (2017). [https://ec.europa.eu/research/openscience/pdf/eosc\\_declaration.pdf](https://ec.europa.eu/research/openscience/pdf/eosc_declaration.pdf)

science environment, from which national actors can learn how to improve the situation in their respective countries. Or, models that have been proven to be successful on the national level can be integrated in the EOSC, leading to enhanced visibility (see Section 3.1) and allowing improvements through the uptake (see Section 3.5).

In specific cases and for individual funding agencies, incentives to align their investments with the EOSC are less obvious. Often, an anti-correlation between the EOSC-readiness and the value of incentives provided by joining the EOSC can be seen. For example, funding agencies supporting communities that have a strong and proven expertise in making data FAIR, and who would thus be able to significantly support connected activities, can be less motivated to join than those, which serve domains that still need a significant development to reach a FAIR data environment. At the same time, the effort to join the EOSC ecosystem is naturally lower for the EOSC-ready communities and their funding agencies, than for those who are EOSC-far. Some of these points are summarised in Figure 2.

Apart from specific incentives for partners that bring highly valuable expertise, services, and infrastructures to the EOSC, also here information is a key factor. In order to encourage funding agencies and ministries in charge of EOSC-ready communities to align their investments, incentives have to be highlighted and communicated. The “what’s in it for me?” question for these communities should be addressed. The answer and potential motivation to this question includes, but is not restricted to, aspects like easiness to adopt data, services and e-infrastructures to be integrated in the EOSC, the positive impact the EOSC will have on the visibility of national activities and on the uptake of specific services, and on the possibility to create EOSC-like environments on the national level. It is important to point out that the end users in these communities will benefit from the EOSC-related activities through improved offers to meet user demands and thus to a higher quality of research output.

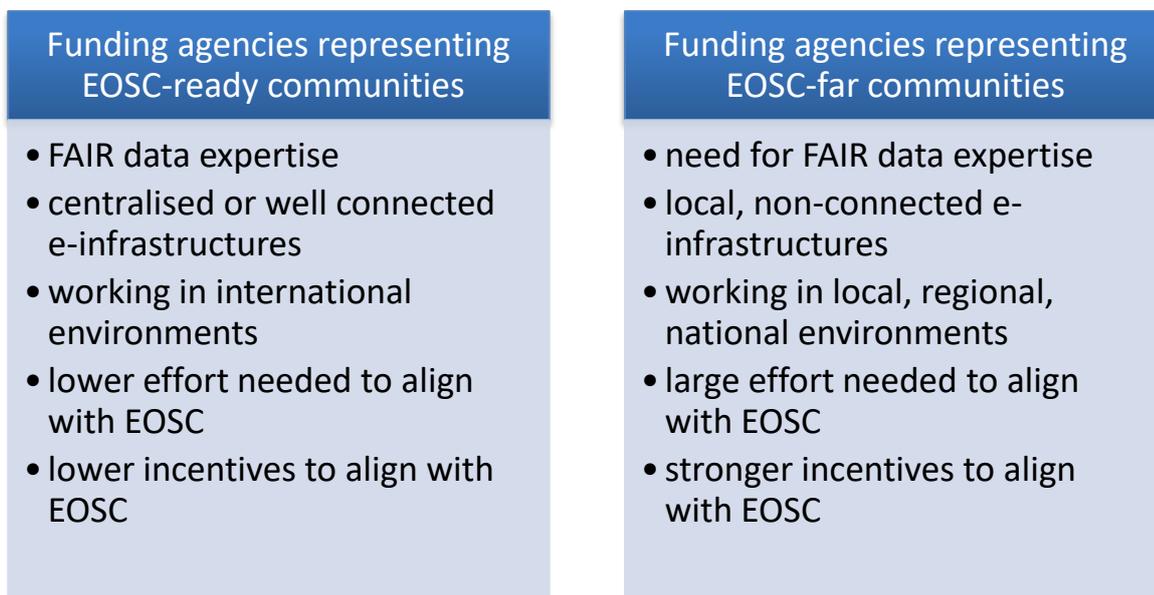
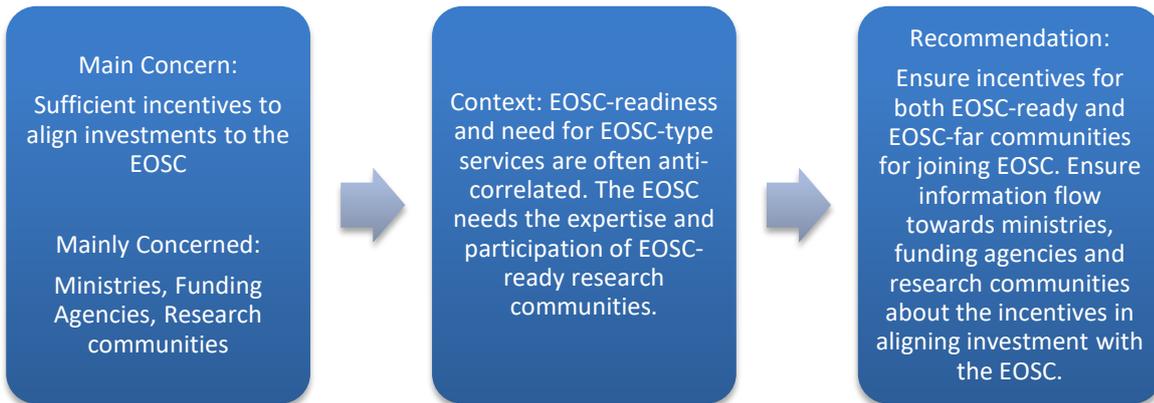


Figure 2: Incentives to join the EOSC and EOSC-readiness is often anti-correlated.

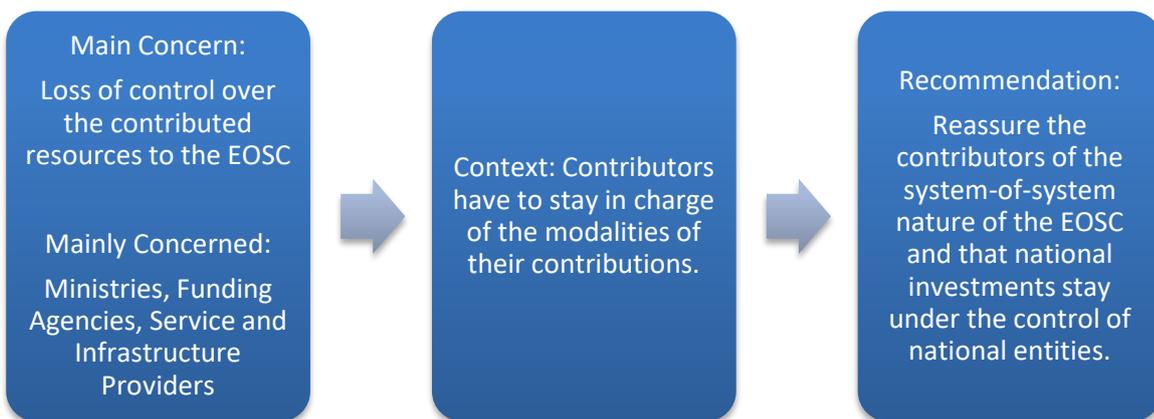


**Figure 3: Incentives have to be communicated to the national actors in order to facilitate their decision to align investments with the EOSC.**

### 3.3 Control

Engaging in the EOSC requires committing resources to a system-of-systems. A perceived risk is to lose the immediate control over these contributions. For example, e-infrastructure providers and their funding agencies need to stay in control over the usage of these provisions, and they need to remain in charge in terms of decisions about future investments and what these investments will be used for. Another example are the human resources bound in the EOSC supporting activities. Decisions about the necessary profile of colleagues working on EOSC related tasks, on their scheduling and availability. This concern is also shared by some of the ministries implicated in the building up of the EOSC.

Part of these perceived risks will be mitigated once the governance model of the EOSC is in place. In this sense, this issue is also related to the need for clearly identified objectives and model of the EOSC, as described in the section 3.4. Another mitigation measure is to reassure the partners involved, that the EOSC is indeed going to be a system-of-systems, and is not going to directly govern national contributions.



**Figure 4: National investments have to stay under the control of national entities.**

### 3.4 Identified Objectives

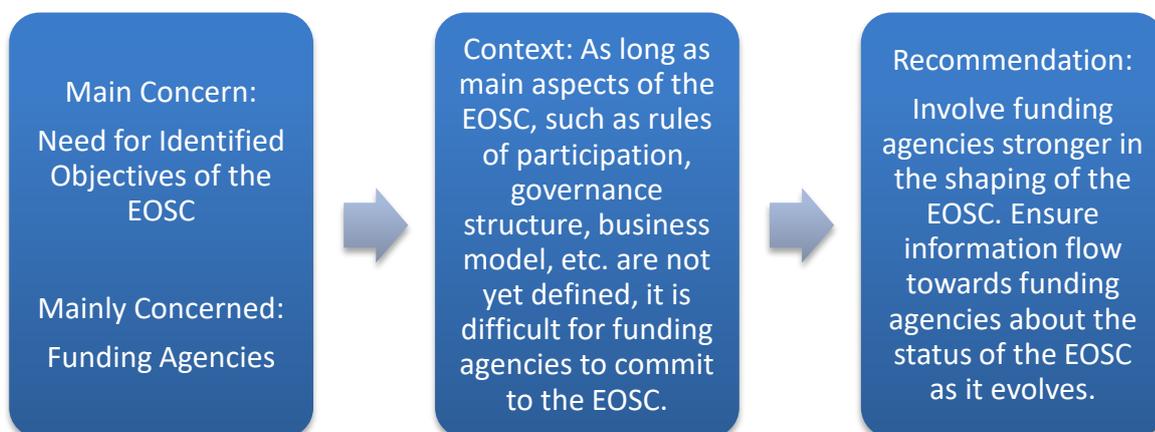
In order to participate in a large, European-wide, and long lasting program like the EOSC, potential contributors need to obtain detailed information about what this program will entail, what the rules of participation and utilization are, etc.

Although the vision of the EOsc has been agreed upon for some years now, the EOsc system itself is in evolution and important details, such as funding schemes and governance mandates, still have to be discussed. Whereas ministries as representatives of the member states have a direct influence on these important aspects, the situation for funding agencies is more complex, because at the time being their possibility of direct influence is limited to being members of the Stakeholder Forum (see for example SWD(2018) 83 final<sup>7</sup>). On the one hand they are encouraged to participate in the EOsc. This can be through calls for proposals from the European Commission in the H2020 program, or through their superior ministries, representing the interests of the member states as EOsc partners.

On the other hand, as long as the EOsc model is not fully defined, funding agencies see the risk in engaging into a system, which will in the long-term request an increased amount of resources from them. Thus, a perceived risk of funding agencies is that by engaging human resources, services, and infrastructures in the EOsc, they commit to a system for which the final structure and rules are yet to be defined, and that their superior ministries, who are committed to the EOsc, will suggest further and increased contribution to the EOsc. Thus, this is closely linked to the aspect of control over resources, as outlined in the previous section.

Ministries, however, appear less concerned by the evolving nature of the EOsc. On the one hand, they are directly part of the EOsc board. On the other hand, they can promote direct requests for participation in the EOsc to their funding agencies, advising them to finance EOsc support out of existing research budgets.

Funding agencies can participate in the shaping of the EOsc, and many of them do. However, the type of engagement varies strongly from country to country and depends also naturally on the impact a funding agency has (in terms of human resources and infrastructures related and concerning the annual budget). To enable funding agencies to commit to the EOsc, they have to be kept up-to-date about the status of the EOsc as it evolves.



**Figure 5: The fact that the EOsc is an evolving system can make it difficult to engage. Here, information flow to and from the EOsc towards funding agencies and ministries is key.**

### 3.5 Uptake

On the national level, a large range of solutions for EOsc-typical challenges exists. This can be in the context of supporting and assuring data FAIRness, this can be successful e-infrastructure computing models combining heterogeneous and distributed systems, or ways to engage the private sector in research related data handling activities. A strong expectation of funders is that the EOsc will empower the uptake and upscaling of services and solutions from the regional and national to the European level. In the case of regional or small scientific community specific services and e-infrastructures, the aim is also to provide

<sup>7</sup> See: Commission Staff Working Document, "Implementation Roadmap for the European Open Science Cloud", European Commission, 2018. [https://ec.europa.eu/research/openscience/pdf/swd\\_2018\\_83\\_f1\\_staff\\_working\\_paper\\_en.pdf](https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf)

national solutions through the EOSC participation. This is also an important incentive to align national investments to the EOSC (see Section 3.2).

Thus, the willingness to participate is also related to the support receivable from the European Commission in the H2020 and in the Horizon-Europe program for the uptake activities. The EOSC should play a major role here, especially in providing models and advice on best practices, as well as on governance models that can be down-scaled from the European to the national level, to help countries to align with the EOSC activities. This way, the EOSC can support the required restructuring on the national level, which then enables to align investments to the objectives of the EOSC.



Figure 6: Uptake of regional/national services and solutions to the European level is a key aspect.

### 3.6 Sustainability

A key factor for funding agencies and ministries is to create sustainable solutions. Although this might be a trivial statement, the current will to support the EOSC on the EC, national, and funding agency level, does not necessarily guarantee this willingness in the future. It has to be discussed, whether the setup is sufficient to guarantee sustainability of the EOSC, which requires a significant amount of investment on the national level on the long term.

Funding agencies are concerned by possible changes of the political will to engage in the EOSC through the 4 to 5-year cycles of governments in their respective countries. Also, on the European level, elections change the parliament and a shift in political will to support the EOSC is possible. In addition, the fact that the EOSC is under the responsibility of two directorates of the European Commission (DG-RTD and DG-CONNECT) has created among several funders a perceived risk of discontinuity in the EOSC building.

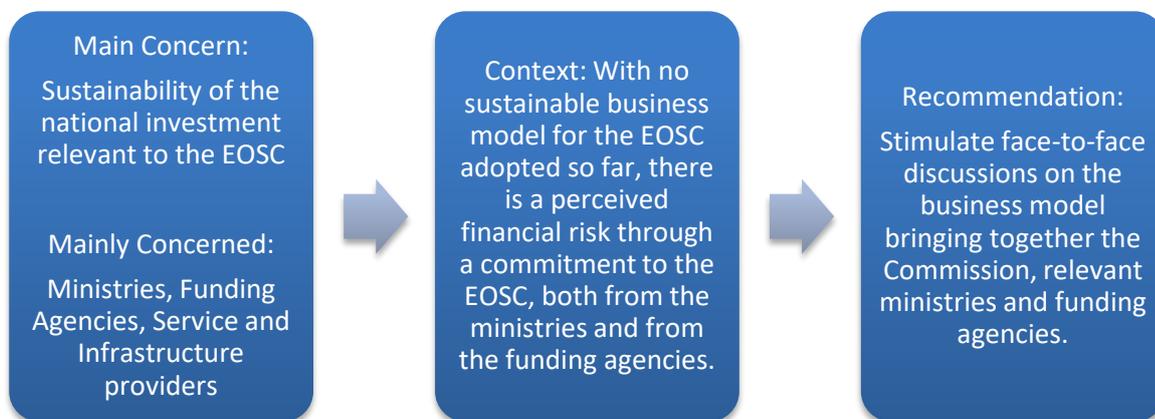
In addition, funding agencies face the risk of having to shoulder the main load of supporting the infrastructures and services that create the EOSC. While the European Commission is committed to supporting the core services, interfaces, and general governance of the EOSC, the funding agencies rely on their respective ministries to support their EOSC-related efforts. As long as a business model for the EOSC has not yet been agreed upon, the risk for funding agencies is that their contribution might have to be accommodated within the frame of the existing budget. Ministries might not provide additional financial support for EOSC-related expenses, and whether the EOSC is going to lead to an effective saving of expenses by funding agencies in the future has still to be proven.

The issue of sustainability of national contributions to the EOSC in part concerns ministries. As they are relying on the funding agencies and the scientific communities in their countries to support building the EOSC once the member states have agreed to actively contribute to the EOSC, they require engagement and enthusiasm from them. Because, if in turn the community at large is then not willing to take up the EOSC and to permanently support its vision and services, this could be seen as a failure of the ministries involved and thus might have consequences on the political level.

This can lead to a situation, where service and infrastructure providers and their funding agencies wait for ministries to provide additional funding to support the EOOSC-related activities, whereas the ministries expect in return that the funding agencies and communities will first significantly participate in the process, before being willing to commit.

Thus, the aspect of sustainability has three major partners that have to be brought together: the European Commission itself, the concerned ministries, and the funding agencies. Whereas in some countries funding agencies are directly involved in the discussion between the ministries and the European Commission about the possible long-term business model, and thus funding of the EOOSC, in others the point of view of funding agencies is not necessarily taken into account.

A general recommendation here is to bring these different stakeholders closer together in the discussion of business (and governance) structures of the EOOSC. More specific recommendations are difficult to give. Although the commission and member states are explicitly leading the EOOSC through the EOOSC board, the influence of the service and infrastructure providers and their funding agencies is primarily foreseen through the Stakeholders Forum<sup>8</sup>. It should be openly discussed, whether this approach can provide a long-term sustainable EOOSC.



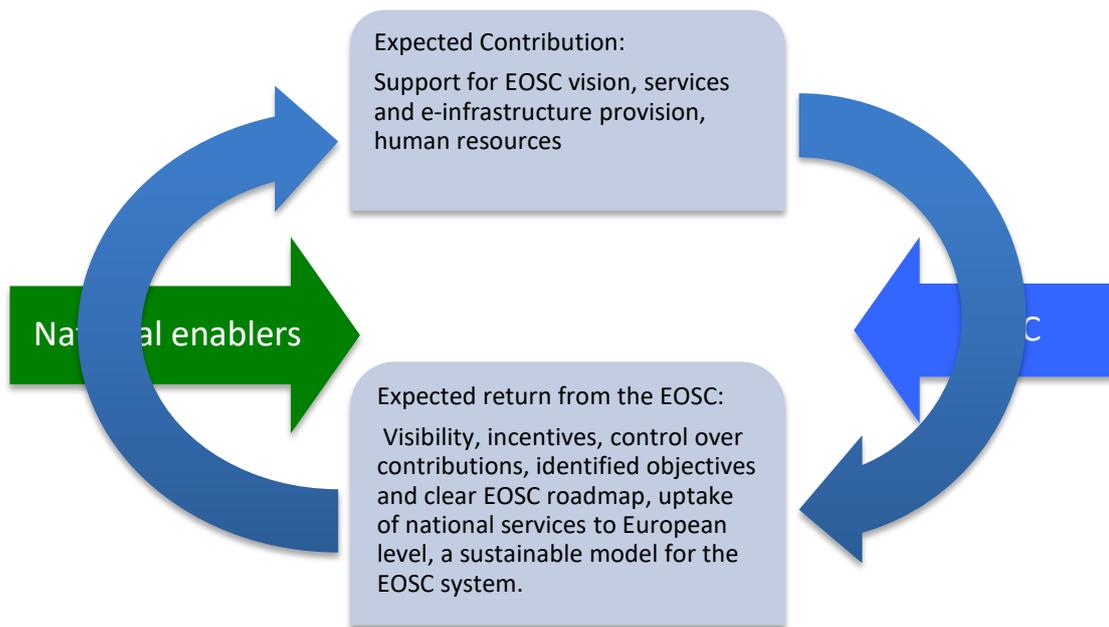
**Figure 7: Long-term sustainability requires discussions of the European Commission with ministries and funding agencies at the same time.**

<sup>8</sup> See for example, Figure 2 in the Commission Staff Working Document, "[Implementation Roadmap for the European Open Science Cloud](#)".

## 4 CONCLUSION

Aligning national investments relevant to the objectives of the EOsc will be crucial to achieving a sustainable system. In this document we have pointed out some of the challenges and opportunities that especially concern funding agencies and ministries in this process.

The results of the reflection presented here are summarized in Figure 8. In return for the expected contributions from the national enablers, such as funding agencies and ministries, these entities in turn expect advantages for the national activities supported by them. In addition, clear rules of participation, adequate governance, and a consistent and detailed EOsc road map are a prerequisite for national investments to be aligned to the objectives of the EOsc.



**Figure 8: The expected contributions from national enablers are balanced by VIOU expectations towards the EOsc**