

Monitoring Framework for National Contributions to EOSC and Open Science (Version 2)

Deliverable Number and Name	D2.1 - Monitoring Alignment Report and Guidelines
Due Date	31 March 2025
Delivery Date	21 February 2025
Work Package	Subcontract
Type	R = Document/Report
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Approved by	OpenAIRE
Dissemination Level	Public
Version	V1.0
Number of Pages	40
DOI	10.5281/zenodo.14919248

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This project has received funding from the European Union's Horizon Europe framework programme under grant agreement No. 101148217. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the European Research Executive Agency can be held responsible for them.

Revision History

Version	Date	Description	Authors/Contributors
V0.1	23/09/2024	Table of contents drafted	Gareth O'Neill
V0.2	16/10/2024	First input from EOSC-SB	Gareth O'Neill, Volker Beckmann, Oleksandr Berezko, Ioanna Grypari, Anna Krivjanska, Stefan Liebler, Stefania Martziou, Ilaria Nardello, Anita Pazik-Aybar, Roberto Sabatino, Elisa Seminaroti, Tereza Simova, Mikaela Stancheva, Lennart Stoy, Philip Van Avermaet, Zaiga Vītola, and Kathrin Winkler
V0.3	04/10/2024	Second input from EOSC-SB	Gareth O'Neill, Anna Bertelli, Laura Valeria Bonora Eve, Stefan Liebler, Natalia Manola, Stefania Martziou, Ilaria Nardello, Aneta Pazik-Aybar, Pilar Rico Castro, Roberto Sabatino, Tereza Simova, Mikaela Stancheva, Marta Teperek, Zaiga Vītola, Kathrin Winkler, and Daniel Zdun
V0.4	13/12/2024	First draft version of report	Gareth O'Neill
V0.5	29/01/2025	Second draft version of report	Gareth O'Neill
V0.6	20/02/2025	Report reviewed and revised	Gareth O'Neill, EOSC Steering Board, and Tereza Simova
V1.0	21/02/2025	Final version of report	Gareth O'Neill

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EOSC Track is a project funded by the European Union (Grant Agreement No 101148217).

Abbreviations

AAP	Additional Activities Plan
AC	Associated Countries
CoARA	Coalition for Advancing Research Assessment
DOI	Digital Object Identifier
EOSC-A	EOSC Association
EOSC-SB	EOSC Steering Board
EC	European Commission
EOSC	EOSC Portal/EOSC Node/European Open Science Cloud
ERA	European Research Area
EU	European Union
FAIR	Findable, Accessible, Interoperable, and Reusable
IPR	Intellectual Property Right
KPI	Key Performance Indicator
MS	Member States
GRAPH	OpenAIRE Graph
OSMI	Open Science Monitoring Initiative
R&D	Research and Development
RFO	Research-funding Organisation
RPO	Research-performing Organisation
TBD	To Be Determined
UNESCO	United Nations Educational, Scientific, and Cultural Organisation

Executive Summary

This report presents a revised version of the *Monitoring Framework for National Contributions to EOSC and Open Science* which consists of 12 types of monitoring indicators for policies, practices, and impacts across eight categories relevant for EOSC and Open Science.

	Policies	Practices	Impacts
Publications	Countries with a National Policy	Countries with National Monitoring	Country Impact Stories
Data			
Software	Countries with a Financial Strategy	County Use Cases	Country Output Outcomes
Services			
Infrastructure	Country RPOs with a Policy	Country Investments	Correlation between Country Indicators
Skills/Training			
Assessment	Country RFOs with a Policy	Country Outputs	Yearly Progress in Country Indicators
Engagement			

The revised monitoring framework consists of 138 monitoring indicators which form the basis for the questions in the annual Survey on National Contributions to EOSC and Open Science which is targeted at the members of the EOSC Steering Board to monitor the national implementation and uptake of EOSC and Open Science across countries in Europe.

The revised monitoring framework will be implemented in the questions of the Survey on National Contributions to EOSC and Open Science 2024 and may be further revised in future depending on the appropriateness of the indicators and needs of the EOSC Steering Board.

1. Introduction

This report presents a revised version of the *Monitoring Framework for National Contributions to EOSC and Open Science* and is deliverable D2.1 by Technopolis Group Belgium for the EOSC Track project [1]. The report offers a systematic model for monitoring the implementation and uptake of the European Open Science Cloud (EOSC) [2] and Open Science by Member States (MS) of the European Union (EU) and Associated Countries (AC) to Horizon Europe. The first version of the framework (Version 1) [3] was developed iteratively in the EOSC Future project [4] in close collaboration with the members of the EOSC Steering Board (EOSC-SB) [5]. This second version of the framework (Version 2) has been created in EOSC Track together with the EOSC-SB over two online workshops held on 16 October 2024 and 04 December 2024.

The monitoring framework forms the basis of the questions in the annual Survey on National Contributions to EOSC and Open Science which is targeted at the members of the EOSC-SB and has been piloted in Survey 2021 [6] and implemented in Survey 2022 [7] and Survey 2023 [8]. The EOSC-SB is an expert group of representatives of MS/AC which strategically advises the European Commission (EC) on the implementation of EOSC and Open Science as part of the European Research Area (ERA) Policy Agenda [9]. The framework supports the EOSC-SB in benchmarking and monitoring the national realisation of EOSC and Open Science as well as exchanging experiences and best practices to foster collaboration at national level in Europe. The results of the surveys are presented publicly in the EOSC Open Science Observatory [10] and together with related documentation in the EOSC Observatory Zenodo Community [11].

The monitoring framework consists of a wide range of indicators for policies, practices, and impacts relevant for EOSC and Open Science at the national level. This report first sketches key initiatives in the monitoring landscape and the structure of the monitoring framework (Section 2). The report then lists the indicators for policies, practices, and impacts across eight categories relevant for EOSC and Open Science and highlights changes in the indicators in the revised framework (Section 3). The report then translates the indicators into concrete questions on policies, practices, and impact across the eight categories relevant for EOSC and Open Science for the annual survey targeted at the EOSC-SB and again highlights changes in the questions in the revised annual survey starting from Survey 2024 (Section 4). The report closes with some conclusions and future steps for the monitoring framework (Section 5).

2. Monitoring Framework

2.1. Monitoring Landscape

The EOSC-SB is playing a leading role in the detailed monitoring of the implementation and uptake of EOSC and Open Science at country level in Europe through the monitoring framework and annual surveys for National Contributions to EOSC and Open Science. There are also other initiatives by the EOSC Association (EOSC-A) [12], EC, and UNESCO which are monitoring EOSC and/or Open Science at organisational and national level in Europe and beyond. The Monitoring Framework for National Contributions to EOSC and Open Science has been developed taking these key initiatives and their monitoring frameworks into account.

The EOSC-A is a non-profit organisation based in Brussels which consists of organisational members representing the research community including research-performing organisations (RPOs) and research-funding organisations (RFOs). The EOSC-A is engaged with the EC in the EOSC Partnership [13] which aims to build a web of data and services which are Findable, Accessible, Interoperable, and Reusable (FAIR) [14] and support the implementation and uptake of EOSC and Open Science in Europe. The members of EOSC-A are investing €500 million in in-kind contributions while the EC is investing €450 million in project funding in the EOSC Partnership during Horizon Europe. The EOSC-A is monitoring and reporting on the implementation of the partnership by its members via two surveys [15]. The annual Additional Activities Plan (AAP) survey [16] collects in-kind contributions to the partnership and the biennial Key Performance Indicators (KPIs) survey [17] collects contributions to achieving the KPIs of the Monitoring Framework for the EOSC Partnership [18]. The monitoring framework consists of 18 KPIs linked to the strategic and operational objectives of the EOSC Partnership.

The EC is monitoring the implementation of the 16 priority areas for joint action for the ERA as defined in the Pact for Research and Innovation in Europe [19] through the monitoring of the ERA Performance Indicators [20]. Priority #1 focuses on supporting and rewarding Open Science principles and practices including open access to research publications and data. Priority #2 focuses on opening access and improving exploitation of research infrastructures including connecting to EOSC. There are in total 18 performance indicators whereby two indicators are for the general progress of research and innovation in Europe (Indicators #1-2)

and there is one indicator for each of the priority areas (Indicators 3-18). The indicator for Priority #1 (Indicator #3) on 'Open Access Scientific Publications with Digital Object Identifier (DOI) as % of Total Scientific Publications with DOI' is focused on open access publications. The indicator for Priority #2 (Indicator #4) on 'Share of National Public Research and Development (R&D) Expenditure Committed to Joint Programmes and Initiatives, Research Infrastructures, and European Partnerships' is more general and not focused at all on EOSC.

The UNESCO Recommendation on Open Science [21] proposes a set of recommendations for countries on a common definition, shared values and guiding principles, areas of action, and monitoring to support the fair and equitable operationalisation of Open Science at individual, organisational, national, regional, and international level. The recommendation is structured around the four pillars of Open Scientific Knowledge (including scientific publications, open research data, open educational resources, open-source software, and open hardware), Open Science Infrastructures, Open Engagement of Societal Actors, and Open Dialogue with Other Knowledge Systems. UNESCO has set up a Working Group on Open Science Monitoring Framework [22] to develop a framework of qualitative and quantitative indicators to monitor the short, medium, and long-term implementation of the recommendation. UNESCO has further developed a survey and guidelines to support countries in reporting on their national implementation of the recommendation which ran for the first time in 2024 [23]. UNESCO is lastly a founding member of the Open Science Monitoring Initiative (OSMI) [24] which aims to encourage the adoption and implementation of principles for monitoring Open Science.

2.2. Monitoring Matrix

The revised Monitoring Framework for National Contributions to EOSC and Open Science consists of three monitoring dimensions and eight categories relevant for EOSC and Open Science and which form a matrix consisting of a range of monitoring indicators as in Table 1.

	Policies	Practices	Impacts
Publications	Indicators	Indicators	Indicators
Data			
Software			
Services			
Infrastructure			
Skills/Training			
Assessment			
Engagement			

Table 1: Monitoring Matrix for National Contributions to EOSC and Open Science

The monitoring framework consists of three overarching monitoring dimensions:

- Policies = policies guiding the implementation of EOSC and Open Science
- Practices = actions being undertaken to implement EOSC and Open Science
- Impacts = outcomes showcasing the implementation of EOSC and Open Science.

These dimensions are divided into eight categories relevant for EOSC and Open Science:

- Publications = research publications that are available in open access
- Data = research data management and research data that is FAIR/open
- Software = software that enables research and is available in open source
- Services = services that enable research data discovery and exploitation
- Infrastructure = data repositories, data stewardship, and data preservation
- Skills/Training = skills and training for researchers to practise Open Science
- Assessment = incentives and rewards for researchers to practise Open Science
- Engagement = research that engages and involves citizens via citizen science.

2.3. Types of Indicators

The revised Monitoring Framework for National Contributions to EOSC and Open Science consists of 12 types of monitoring indicators for the policies, practices, and impacts which are identified for each of the eight categories relevant for EOSC and Open Science as in Table 2.

	Policies	Practices	Impacts
Publications	Countries with a National Policy	Countries with National Monitoring	Country Impact Stories
Data			
Software	Countries with a Financial Strategy	Country Use Cases	Country Output Outcomes
Services			
Infrastructure	Country RPOs with a Policy	Country Investments	Correlation between Country Indicators
Skills/Training			
Assessment	Country RFOs with a Policy	Country Outputs	Yearly Progress in Country Indicators
Engagement			

Table 2: Monitoring Indicators for National Contributions to EOSC and Open Science

There are four types of indicators for the policies relevant for EOSC and Open Science:

- Countries with a National Policy = countries with a national policy on the category
- Countries with a Financial Strategy = countries with a financial strategy on the category
- Country RPOs with a Policy = RPOs in a country with a policy on the category
- Country RFOs with a Policy = RFOs in a country with a policy on the category.

There are four types of indicators for the practices relevant for EOSC and Open Science:

- Countries with National Monitoring = countries nationally monitoring the category
- Countries with Use Cases = countries with use cases on the category
- Country Investments = country investments in the category
- Country Outputs = country outputs for the category.

There are four types of indicators for the impacts relevant for EOSC and Open Science:

- Country Impact Stories = countries with impact stories on the category
- Country Output Outcomes = country outcomes of outputs for the category
- Correlation between Country Indicators = country overview across categories
- Yearly Progress in Country Indicators = country progress across categories.

3. Monitoring Indicators

3.1. Policy Indicators

There are 48 policy indicators across the eight categories relevant for EOSC and Open Science in the revised Version 2 of the monitoring framework for National Contributions to EOSC and Open Science. No policy indicators have been added, revised, or removed since Version 1.

Publications

1. Countries with a National Policy on Open Access to Publications
2. Countries with a Financial Strategy on Open Access to Publications
3. Country RPOs with a Policy on Open Access to Publications
4. Country RFOs with a Policy on Open Access to Publications

Data

5. Countries with a National Policy on Data Management
6. Countries with a Financial Strategy on Data Management
7. Country RPOs with a Policy on Data Management
8. Country RFOs with a Policy on Data Management

9. Countries with a National Policy on FAIR Data
10. Countries with a Financial Strategy on FAIR Data
11. Country RPOs with a Policy on FAIR Data
12. Country RFOs with a Policy on FAIR Data

13. Countries with a National Policy on Open Data
14. Countries with a Financial Strategy on Open Data
15. Country RPOs with a Policy on Open Data
16. Country RFOs with a Policy on Open Data

Software

17. Countries with a National Policy on Open-source Software
18. Countries with a Financial Strategy on Open-source Software
19. Country RPOs with a Policy on Open-source Software
20. Country RFOs with a Policy on Open-source Software

Services

21. Countries with a National Policy on Offering Services through EOSC
22. Countries with a Financial Strategy on Offering Services through EOSC
23. Country RPOs with a Policy on Offering Services through EOSC
24. Country RFOs with a Policy on Offering Services through EOSC

Infrastructure

25. Countries with a National Policy on Connecting Repositories to EOSC
26. Countries with a Financial Strategy on Connecting Repositories to EOSC
27. Country RPOs with a Policy on Connecting Repositories to EOSC
28. Country RFOs with a Policy on Connecting Repositories to EOSC

29. Countries with a National Policy on Data Stewardship
30. Countries with a Financial Strategy on Data Stewardship
31. Country RPOs with a Policy on Data Stewardship
32. Country RFOs with a Policy on Data Stewardship

33. Countries with a National Policy on Long-term Data Preservation
34. Countries with a Financial Strategy on Long-term Data Preservation
35. Country RPOs with a Policy on Long-term Data Preservation
36. Country RFOs with a Policy on Long-term Data Preservation

Skills/Training

37. Countries with a National Policy on Skills/Training for Open Science
38. Countries with a Financial Strategy on Skills/Training for Open Science
39. Country RPOs with a Policy on Skills/Training for Open Science
40. Country RFOs with a Policy on Skills/Training for Open Science

Assessment

41. Countries with a National Policy on Incentives/Rewards for Open Science
42. Countries with a Financial Strategy on Incentives/Rewards for Open Science
43. Country RPOs with a Policy on Incentives/Rewards for Open Science
44. Country RFOs with a Policy on Incentives/Rewards for Open Science

Engagement

- 45. Countries with a National Policy on Citizen Science
- 46. Countries with a Financial Strategy on Citizen Science
- 47. Country RPOs with a Policy on Citizen Science
- 48. Country RFOs with a Policy on Citizen Science

3.2. Practice Indicators

There are also 48 practice indicators across the eight categories relevant for EOSC and Open Science in Version 2 of the monitoring framework for National Contributions to EOSC and Open Science. Four indicators which were not deemed useful or appropriate by EOSC-SB have been revised (namely country output indicators #56, #80, #88, and #96) since Version 1.

Publications

- 49. Countries with National Monitoring on Open Access to Publications
- 50. Country Use Cases on Open Access to Publications
- 51. Country Investments in Open Access to Publications
- 52. Country Open Access Publications

Data

- 53. Countries with National Monitoring on Data Management
- 54. Country Use Cases on Data Management
- 55. Country Investments in Data Management
- 56. Country Funding Programmes which Mandate Data Management Plans

- 57. Countries with National Monitoring on FAIR Data
- 58. Country Use Cases on FAIR Data
- 59. Country Investments in FAIR Data
- 60. Country FAIR Data Sets

- 61. Countries with National Monitoring on Open Data
- 62. Country Use Cases on Open Data
- 63. Country Investments in Open Data
- 64. Country Open Data Sets

Software

- 65. Countries with National Monitoring on Open-source Software
- 66. Country Use Cases on Open-source Software
- 67. Country Investments in Open-source Software
- 68. Country Open-source Software Sets

Services

- 69. Countries with National Monitoring on Offering Services through EOSC
- 70. Country Use Cases on Offering Services through EOSC
- 71. Country Investments in Offering Services through EOSC
- 72. Country Services Offered through EOSC

Infrastructure

- 73. Countries with National Monitoring on Connecting Repositories to EOSC
- 74. Country Use Cases on Connecting Repositories to EOSC
- 75. Country Investments in Connecting Repositories to EOSC
- 76. Country Repositories Connected to EOSC

- 77. Countries with National Monitoring on Data Stewardship
- 78. Country Use Cases on Data Stewardship
- 79. Country Investments in Data Stewardship
- 80. Country Funding Programmes which Support Data Stewardship

- 81. Countries with National Monitoring on Long-term Data Preservation
- 82. Country Use Cases on Long-term Data Preservation
- 83. Country Investments in Long-term Data Preservation
- 84. Country Repositories Offering Long-term Data Preservation

Skills/Training

- 85. Countries with National Monitoring on Skills/Training for Open Science
- 86. Country Use Cases on Skills/Training for Open Science
- 87. Country Investments in Skills/Training for Open Science
- 88. Country Funding Programmes which Support Skills/training for Open Science

Assessment

- 89. Countries with National Monitoring on Incentives/Rewards for Open Science
- 90. Country Use Cases on Incentives/Rewards for Open Science
- 91. Country Investments in Incentives/Rewards for Open Science
- 92. Country Signatories of Agreement on Reforming Research Assessment

Engagement

- 93. Countries with National Monitoring on Citizen Science
- 94. Country Use Cases on Citizen Science
- 95. Country Investments in Citizen Science
- 96. Country Funding Programmes which Support Citizen Science

3.3. Impact Indicators

There are lastly 42 impact indicators across the eight categories relevant for EOSC and Open Science in Version 2 of the monitoring framework for National Contributions to EOSC and Open Science. These 42 indicators are new and have been added since Version 1 whereby 6 indicators (namely country output outcome indicators #102, #122, #126, #130, #134, and #142) are still to be determined (TBD) in a future revision of the monitoring framework.

Publications

- 97. Country Impact Stories on Open Access to Publications
- 98. Country Citations of Open Access Publications
- 99. Correlation between Country Indicators on Open Access to Publications
- 100. Yearly Progress in Country Indicators on Open Access to Publications

Data

- 101. Country Impact Stories on Data Management
- 102. [TBD]
- 103. Correlation between Country Indicators on Data Management
- 104. Yearly Progress in Country Indicators on Data Management

- 105. Country Impact Stories on FAIR Data
- 106. Country Citations of FAIR Data Sets
- 107. Correlation between Country Indicators on FAIR Data
- 108. Yearly Progress in Country Indicators on FAIR Data

- 109. Country Impact Stories on Open Data
- 110. Country Citations of Open Data Sets
- 111. Correlation between Country Indicators on Open Data
- 112. Yearly Progress in Country Indicators on Open Data

Software

- 113. Country Impact Stories on Open-source Software
- 114. Country Citations of Open-source Software Sets
- 115. Correlation between Country Indicators on Open-source Software
- 116. Yearly Progress in Country Indicators on Open-source Software

Services

- 117. Country Impact Stories on Offering Services through EOSC
- 118. Country Use of Services Offered through EOSC
- 119. Correlation between Country Indicators on Offering Services through EOSC
- 120. Yearly Progress in Country Indicators on Offering Services through EOSC

Infrastructure

- 121. Country Impact Stories on Connecting Repositories to EOSC
- 122. [TBD]
- 123. Correlation between Country Indicators on Connecting Repositories to EOSC
- 124. Yearly Progress in Country Indicators on Connecting Repositories to EOSC

- 125. Country Impact Stories on Data Stewardship
- 126. [TBD]
- 127. Correlation between Country Indicators on Data Stewardship
- 128. Yearly Progress in Country Indicators on Data Stewardship

- 129. Country Impact Stories on Long-term Data Preservation
- 130. [TBD]
- 131. Correlation between Country Indicators on Long-term Data Preservation
- 132. Yearly Progress in Country Indicators on Long-term Data Preservation

Skills/Training

- 133. Country Impact Stories on Skills/Training for Open Science
- 134. [TBD]
- 135. Correlation between Country Indicators on Skills/Training for Open Science
- 136. Yearly Progress in Country Indicators on Skills/Training for Open Science

Assessment

- 137. Country Impact Stories on Incentives/Rewards for Open Science
- 138. Country Action Plans for Agreement on Reforming Research Assessment
- 139. Correlation between Country Indicators on Incentives/Rewards for Open Science
- 140. Yearly Progress in Country Indicators on Incentives/Rewards for Open Science

Engagement

- 141. Country Impact Stories on Citizen Science
- 142. [TBD]
- 143. Correlation between Country Indicators on Citizen Science
- 144. Yearly Progress in Country Indicators on Citizen Science

4. Monitoring Survey

4.1. Policy Questions

The 48 policy indicators have been translated into questions to be asked in the annual survey on National Contributions to EOSC and Open Science. These questions were first asked in Survey 2022 whereby no questions have been added, revised, or removed since Survey 2022. Each question requires a yes/no response (YES/NO), a numerical response (NUMBER), or a free text response (TEXT). Some questions are dependent on a positive response to a previous question (IF YES). All of the questions are to be answered by members of EOSC-SB.

Publications

1. Does your country have a national policy on open access to publications? [YES/NO]
 - 1.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 1.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 1.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 1.3. Is there a specific policy on immediate open access to publications? [YES/NO]
 - 1.3.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 1.3.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 1.3.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 1.4. Is there a specific policy on retention of IPR on publications? [YES/NO]
 - 1.4.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 1.4.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 1.4.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 1.5. Is there a specific policy on open licensing of publications? [YES/NO]
 - 1.5.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 1.5.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 1.5.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 1.6. Please clarify your response if relevant [TEXT]
2. Does your country have a financial strategy on open access to publications? [YES/NO]
 - 2.1. Please clarify your response if relevant [TEXT]

3. How many research-performing organisations in your country have a policy on open access to publications? [NUMBER]
 - 3.1. Please clarify your response if relevant [TEXT]
4. How many research-funding organisations in your country have a policy on open access to publications? [NUMBER]
 - 4.1. Please clarify your response if relevant [TEXT]

Data

5. Does your country have a national policy on data management? [YES/NO]
 - 5.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 5.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 5.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 5.3. Please clarify your response if relevant [TEXT]
6. Does your country have a financial strategy on data management? [YES/NO]
 - 6.1. Please clarify your response if relevant [TEXT]
7. How many research-performing organisations in your country have a policy on data management? [NUMBER]
 - 7.1. Please clarify your response if relevant [TEXT]
8. How many research-funding organisations in your country have a policy on data management? [NUMBER]
 - 8.1. Please clarify your response if relevant [TEXT]
9. Does your country have a national policy on FAIR data? [YES/NO]
 - 9.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 9.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 9.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 9.3. Please clarify your response if relevant [TEXT]
10. Does your country have a financial strategy on FAIR data? [YES/NO]
 - 10.1. Please clarify your response if relevant [TEXT]
11. How many research-performing organisations in your country have a policy on FAIR data? [NUMBER]
 - 11.1. Please clarify your response if relevant [TEXT]
12. How many research-funding organisations in your country have a policy on FAIR data? [NUMBER]
 - 12.1. Please clarify your response if relevant [TEXT]

13. Does your country have a national policy on open data? [YES/NO]
 - 13.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 13.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 13.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 13.3. Please clarify your response if relevant [TEXT]
14. Does your country have a financial strategy on open data? [YES/NO]
 - 14.1. Please clarify your response if relevant [TEXT]
15. How many research-performing organisations in your country have a policy on open data? [NUMBER]
 - 15.1. Please clarify your response if relevant [TEXT]
16. How many research-funding organisations in your country have a policy on open data? [NUMBER]
 - 16.1. Please clarify your response if relevant [TEXT]

Software

17. Does your country have a national policy on open-source software? [YES/NO]
 - 17.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 17.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 17.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 17.3. Please clarify your response if relevant [TEXT]
18. Does your country have a financial strategy on open-source software? [YES/NO]
 - 18.1. Please clarify your response if relevant [TEXT]
19. How many research-performing organisations in your country have a policy on open-source software? [NUMBER]
 - 19.1. Please clarify your response if relevant [TEXT]
20. How many research-funding organisations in your country have a policy on open-source software? [NUMBER]
 - 20.1. Please clarify your response if relevant [TEXT]

Services

21. Does your country have a national policy on offering services through EOSC? [YES/NO]
 - 21.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 21.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 21.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 21.3. Please clarify your response if relevant [TEXT]
22. Does your country have a financial strategy on offering services through EOSC? [YES/NO]
 - 22.1. Please clarify your response if relevant [TEXT]
23. How many research-performing organisations in your country have a policy on offering services through EOSC? [NUMBER]
 - 23.1. Please clarify your response if relevant [TEXT]
24. How many research-funding organisations in your country have a policy on offering services through EOSC? [NUMBER]
 - 24.1. Please clarify your response if relevant [TEXT]

Infrastructure

25. Does your country have a national policy on connecting repositories to EOSC? [YES/NO]
 - 25.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 25.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 25.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 25.3. Please clarify your response if relevant [TEXT]
26. Does your country have a financial strategy on connecting repositories to EOSC? [YES/NO]
 - 26.1. Please clarify your response if relevant [TEXT]
27. How many research-performing organisations in your country have a policy on connecting repositories to EOSC? [NUMBER]
 - 27.1. Please clarify your response if relevant [TEXT]
28. How many research-funding organisations in your country have a policy on connecting repositories to EOSC? [NUMBER]
 - 28.1. Please clarify your response if relevant [TEXT]

29. Does your country have a national policy on data stewardship? [YES/NO]
 - 29.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 29.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 29.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 29.3. Please clarify your response if relevant [TEXT]
30. Does your country have a financial strategy on data stewardship? [YES/NO]
 - 30.1. Please clarify your response if relevant [TEXT]
31. How many research-performing organisations in your country have a policy on data stewardship? [NUMBER]
 - 31.1. Please clarify your response if relevant [TEXT]
32. How many research-funding organisations in your country have a policy on data stewardship? [NUMBER]
 - 32.1. Please clarify your response if relevant [TEXT]
33. Does your country have a national policy on long-term data preservation? [YES/NO]
 - 33.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 33.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 33.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 33.3. Please clarify your response if relevant [TEXT]
34. Does your country have a financial strategy on long-term data preservation? [YES/NO]
 - 34.1. Please clarify your response if relevant [TEXT]
35. How many research-performing organisations in your country have a policy on long-term data preservation? [NUMBER]
 - 35.1. Please clarify your response if relevant [TEXT]
36. How many research-funding organisations in your country have a policy on long-term data preservation? [NUMBER]
 - 36.1. Please clarify your response if relevant [TEXT]

Skills/Training

37. Does your country have a national policy on skills/training for Open Science? [YES/NO]
 - 37.1. [IF YES] Is this policy mandatory? [YES/NO]
 - 37.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
 - 37.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 37.3. Please clarify your response if relevant [TEXT]

38. Does your country have a financial strategy on skills/training for Open Science? [YES/NO]
38.1. Please clarify your response if relevant [TEXT]
39. How many research-performing organisations in your country have a policy on skills/training for Open Science? [NUMBER]
39.1. Please clarify your response if relevant [TEXT]
40. How many research-funding organisations in your country have a policy on skills/training for Open Science? [NUMBER]
40.1. Please clarify your response if relevant [TEXT]

Assessment

41. Does your country have a national policy on incentives/rewards for Open Science? [YES/NO]
41.1. [IF YES] Is this policy mandatory? [YES/NO]
41.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
41.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
41.3. Please clarify your response if relevant [TEXT]
42. Does your country have a financial strategy on incentives/rewards for Open Science? [YES/NO]
42.1. Please clarify your response if relevant [TEXT]
43. How many research-performing organisations in your country have a policy on incentives/rewards for Open Science? [NUMBER]
43.1. Please clarify your response if relevant [TEXT]
44. How many research-funding organisations in your country have a policy on incentives/rewards for Open Science? [NUMBER]
44.1. Please clarify your response if relevant [TEXT]

Engagement

45. Does your country have a national policy on citizen science? [YES/NO]
45.1. [IF YES] Is this policy mandatory? [YES/NO]
45.2. [IF YES] Is information on this policy available publicly on the web? [YES/NO]
45.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
45.3. Please clarify your response if relevant [TEXT]
46. Does your country have a financial strategy on citizen science? [YES/NO]
46.1. Please clarify your response if relevant [TEXT]

47. How many research-performing organisations in your country have a policy on citizen science? [NUMBER]
47.1. Please clarify your response if relevant [TEXT]
48. How many research-funding organisations in your country have a policy on citizen science? [NUMBER]
48.1. Please clarify your response if relevant [TEXT]

4.2. Practice Questions

The 48 practice indicators have also been translated into questions to be asked in the annual survey on National Contributions to EOSC and Open Science. Most questions were first asked in Survey 2022 whereby 5 questions have been revised (namely questions #56, #80, #88, #92, and #96) since Survey 2022 and will be first asked in Survey 2024. Each question requires a yes/no response (YES/NO), a numerical response (NUMBER) which may in some cases require two responses (NUMBER x 2), or a free text response (TEXT). Some questions are dependent on a positive response to a previous question (IF YES). Some questions are focused on a specific year (YEAR). Some questions are not to be answered by members of EOSC-SB whereby data will instead be extracted from external data sources including the OpenAIRE Graph (GRAPH) [25], old EOSC Portal [26] or new EOSC Nodes [27] (EOSC), and Coalition for Advancing Research Assessment (CoARA) [28] (namely questions #52, #64, #68, #72, #76, #92). Two questions will lastly be paused in Survey 2024 and will only be asked in future surveys (FUTURE) (namely questions #60 and #84) when relevant external data is available.

Publications

49. Does your country have a national monitoring on open access to publications? [YES/NO]
49.1. Please clarify your response if relevant [TEXT]
50. Does your country have use cases on open access to publications? [YES/NO]
50.1. [IF YES] Please provide a short description of the use case [TEXT]
50.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
50.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
50.3. Please clarify your response if relevant [TEXT]

51. How much did your country financially invest in open access to publications in [YEAR] in millions of Euros? [NUMBER]
51.1. Please clarify your response if relevant [TEXT]
52. How many publications were published in open access in your country in [YEAR]? [NUMBER] [GRAPH]

Data

53. Does your country have a national monitoring on data management? [YES/NO]
53.1. Please clarify your response if relevant [TEXT]
54. Does your country have use cases on data management? [YES/NO]
54.1. [IF YES] Please provide a short description of the use case [TEXT]
54.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
54.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
54.3. Please clarify your response if relevant [TEXT]
55. How much did your country financially invest in data management in [YEAR] in millions of Euros? [NUMBER]
55.1. Please clarify your response if relevant [TEXT]
56. How many and what percentage of national funding programmes which mandate the use of Data Management Plans (DMPs) (in projects) were there in your country in [YEAR]? [NUMBER x 2]
56.1. Please clarify your response if relevant [TEXT]
57. Does your country have a national monitoring on FAIR data? [YES/NO]
57.1. Please clarify your response if relevant [TEXT]
58. Does your country have use cases on FAIR data? [YES/NO]
58.1. [IF YES] Please provide a short description of the use case [TEXT]
58.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
58.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
58.3. Please clarify your response if relevant [TEXT]
59. How much did your country financially invest in FAIR data in [YEAR] in millions of Euros? [NUMBER]
59.1. Please clarify your response if relevant [TEXT]
60. How many FAIR data sets were published in your country in [YEAR]? [NUMBER] [FUTURE]

61. Does your country have a national monitoring on open data? [YES/NO]
61.1. Please clarify your response if relevant [TEXT]
62. Does your country have use cases on open data? [YES/NO]
62.1. [IF YES] Please provide a short description of the use case [TEXT]
62.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
62.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
62.3. Please clarify your response if relevant [TEXT]
63. How much did your country financially invest in open data in [YEAR] in millions of Euros? [NUMBER]
63.1. Please clarify your response if relevant [TEXT]
64. How many open data sets were published in your country in [YEAR]? [NUMBER] [GRAPH]

Software

65. Does your country have a national monitoring on open-source software? [YES/NO]
65.1. Please clarify your response if relevant [TEXT]
66. Does your country have use cases on open-source software? [YES/NO]
66.1. [IF YES] Please provide a short description of the use case [TEXT]
66.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
66.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
66.3. Please clarify your response if relevant [TEXT]
67. How much did your country financially invest in open-source software in [YEAR] in millions of Euros? [NUMBER]
67.1. Please clarify your response if relevant [TEXT]
68. How many open-source software sets were published in your country in [YEAR]? [NUMBER] [GRAPH]

Services

69. Does your country have a national monitoring on offering services through EOSC? [YES/NO]
69.1. Please clarify your response if relevant [TEXT]

70. Does your country have use cases on offering services through EOSC? [YES/NO]
 - 70.1. [IF YES] Please provide a short description of the use case [TEXT]
 - 70.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
 - 70.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 70.3. Please clarify your response if relevant [TEXT]
71. How much did your country financially invest in offering services through EOSC in [YEAR] in millions of Euros? [NUMBER]
 - 71.1. Please clarify your response if relevant [TEXT]
72. How many services were offered through EOSC in your country in [YEAR]? [NUMBER] [EOSC]

Infrastructure

73. Does your country have a national monitoring on connecting repositories to EOSC? [YES/NO]
 - 73.1. Please clarify your response if relevant [TEXT]
74. Does your country have use cases on connecting repositories to EOSC? [YES/NO]
 - 74.1. [IF YES] Please provide a short description of the use case [TEXT]
 - 74.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
 - 74.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 74.3. Please clarify your response if relevant [TEXT]
75. How much did your country financially invest in connecting repositories to EOSC in [YEAR] in millions of Euros? [NUMBER]
 - 75.1. Please clarify your response if relevant [TEXT]
76. How many repositories were connected to EOSC in your country in [YEAR]? [NUMBER] [EOSC]
77. Does your country have a national monitoring on data stewardship? [YES/NO]
 - 77.1. Please clarify your response if relevant [TEXT]
78. Does your country have use cases on data stewardship? [YES/NO]
 - 78.1. [IF YES] Please provide a short description of the use case [TEXT]
 - 78.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
 - 78.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 78.3. Please clarify your response if relevant [TEXT]

79. How much did your country financially invest in data stewardship in [YEAR] in millions of Euros? [NUMBER]
79.1. Please clarify your response if relevant [TEXT]
80. How many and what percentage of national funding programmes which support data stewardship (in projects) were there in your country in [YEAR]? [NUMBER x 2]
80.1. Please clarify your response if relevant [TEXT]
81. Does your country have a national monitoring on long-term data preservation? [YES/NO]
81.1. Please clarify your response if relevant [TEXT]
82. Does your country have use cases on long-term data preservation? [YES/NO]
82.1. [IF YES] Please provide a short description of the use case [TEXT]
82.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
82.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
82.3. Please clarify your response if relevant [TEXT]
83. How much did your country financially invest in long-term data preservation in [YEAR] in millions of Euros? [NUMBER]
83.1. Please clarify your response if relevant [TEXT]
84. How many repositories offered long-term data preservation in your country in [YEAR]? [NUMBER] [FUTURE]

Skills/Training

85. Does your country have a national monitoring on skills/training for Open Science? [YES/NO]
85.1. Please clarify your response if relevant [TEXT]
86. Does your country have use cases on skills/training for Open Science? [YES/NO]
86.1. [IF YES] Please provide a short description of the use case [TEXT]
86.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
86.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
86.3. Please clarify your response if relevant [TEXT]
87. How much did your country financially invest in skills/training for Open Science in [YEAR] in millions of Euros? [NUMBER]
87.1. Please clarify your response if relevant [TEXT]

88. How many and what percentage of national funding programmes which support skills/training for Open Science (in projects) were there in your country in [YEAR]? [NUMBER x 2]
88.1. Please clarify your response if relevant [TEXT]

Assessment

89. Does your country have a national monitoring on incentives/rewards for Open Science? [YES/NO]
89.1. Please clarify your response if relevant [TEXT]
90. Does your country have use cases on incentives/rewards for Open Science? [YES/NO]
90.1. [IF YES] Please provide a short description of the use case [TEXT]
90.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
90.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
90.3. Please clarify your response if relevant [TEXT]
91. How much did your country financially invest in incentives/rewards for Open Science in [YEAR] in millions of Euros? [NUMBER]
91.1. Please clarify your response if relevant [TEXT]
92. How many signatories of the Agreement on Reforming Research Assessment were there in your country in [YEAR]? [NUMBER] [CoARA]

Engagement

93. Does your country have a national monitoring on citizen science? [YES/NO]
93.1. Please clarify your response if relevant [TEXT]
94. Does your country have use cases on citizen science? [YES/NO]
94.1. [IF YES] Please provide a short description of the use case [TEXT]
94.2. [IF YES] Is information on this use case available publicly on the web? [YES/NO]
94.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
94.3. Please clarify your response if relevant [TEXT]
95. How much did your country financially invest in citizen science in [YEAR] in millions of Euros? [NUMBER]
95.1. Please clarify your response if relevant [TEXT]
96. How many and what percentage of national funding programmes which support citizen science (in projects) were there in your country in [YEAR]? [NUMBER x 2]
96.1. Please clarify your response if relevant [TEXT]

4.3. Impact Questions

18 of the 42 impact indicators have been translated into questions to be asked in the annual survey on National Contributions to EOSC and Open Science. 17 questions are new and will be first asked in Survey 2024. Each question requires a yes/no response (YES/NO), a numerical response (NUMBER), or a free text response (TEXT). Some questions are dependent on a positive response to a previous question (IF YES). Some questions are focused on a specific year (YEAR). 12 questions are to be answered by members of EOSC-SB (namely questions #97, #101, #105, #109, #113, #117, #121, #125, #129, #133, #137, and #141). Five questions are not to be answered by representatives of EOSC-SB whereby data will be extracted from external data sources (GRAPH, EOSC, CoARA) (namely questions #98, #110, #114, #118, and #138). One question will be paused in Survey 2024 and only be asked in future surveys (FUTURE) (namely question #106) when relevant external data is available to be collected.

The remaining 24 of the 42 impact indicators have not been translated into questions (NO QUESTION) for the annual survey on National Contributions to EOSC and Open Science. These indicators focus on the correlation between and yearly progress of the various indicators of the monitoring framework and will be addressed separately in an analysis (ANALYSIS) of the collected survey data. There are six potential impact indicators, as explained earlier, which may be added to the monitoring framework in future whereby corresponding questions will then be determined (TBD) (namely questions #102, #122, #126, #130, #134, and #142).

Publications

- 97. Does your country have impact stories on open access to publications? [YES/NO]
 - 97.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 97.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 97.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 97.3. Please clarify your response if relevant [TEXT]
- 98. How many citations of open access publications were there in your country in [YEAR]? [NUMBER] [GRAPH]
- 99. [NO QUESTION] [ANALYSIS]
- 100. [NO QUESTION] [ANALYSIS]

Data

101. Does your country have impact stories on data management? [YES/NO]
 - 101.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 101.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 101.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 101.3. Please clarify your response if relevant [TEXT]
102. [NO QUESTION] [TBD]
103. [NO QUESTION] [ANALYSIS]
104. [NO QUESTION] [ANALYSIS]
105. Does your country have impact stories on FAIR data? [YES/NO]
 - 105.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 105.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 105.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 105.3. Please clarify your response if relevant [TEXT]
106. How many citations of FAIR data sets were there in your country in [YEAR]? [NUMBER] [FUTURE]
107. [NO QUESTION] [ANALYSIS]
108. [NO QUESTION] [ANALYSIS]
109. Does your country have impact stories on open data? [YES/NO]
 - 109.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 109.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 109.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 109.3. Please clarify your response if relevant [TEXT]
110. How many citations of open data sets were there in your country in [YEAR]? [NUMBER] [GRAPH]
111. [NO QUESTION] [ANALYSIS]
112. [NO QUESTION] [ANALYSIS]

Software

- 113. Does your country have impact stories on open-source software? [YES/NO]
 - 113.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 113.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 113.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 113.3. Please clarify your response if relevant [TEXT]
- 114. How many citations of open-source software sets were there in your country in [YEAR]? [NUMBER] [GRAPH]
- 115. [NO QUESTION] [ANALYSIS]
- 116. [NO QUESTION] [ANALYSIS]

Services

- 117. Does your country have impact stories on offering services through EOSC? [YES/NO]
 - 117.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 117.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 117.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 117.3. Please clarify your response if relevant [TEXT]
- 118. How many services offered through EOSC were used in your country in [YEAR]? [NUMBER] [EOSC]
- 119. [NO QUESTION] [ANALYSIS]
- 120. [NO QUESTION] [ANALYSIS]

Infrastructure

- 121. Does your country have impact stories on connecting repositories to EOSC? [YES/NO]
 - 121.1. [IF YES] Please provide a short description of the impact story [TEXT]
 - 121.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
 - 121.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
 - 121.3. Please clarify your response if relevant [TEXT]
- 122. [NO QUESTION] [TBD]
- 123. [NO QUESTION] [ANALYSIS]

124. [NO QUESTION] [ANALYSIS]
125. Does your country have impact stories on data stewardship? [YES/NO]
125.1. [IF YES] Please provide a short description of the impact story [TEXT]
125.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
125.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
125.3. Please clarify your response if relevant [TEXT]
126. [NO QUESTION] [TBD]
127. [NO QUESTION] [ANALYSIS]
128. [NO QUESTION] [ANALYSIS]
129. Does your country have impact stories on long-term data preservation? [YES/NO]
129.1. [IF YES] Please provide a short description of the impact story [TEXT]
129.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
129.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
129.3. Please clarify your response if relevant [TEXT]
130. [NO QUESTION] [TBD]
131. [NO QUESTION] [ANALYSIS]
132. [NO QUESTION] [ANALYSIS]

Skills/Training

133. Does your country have impact stories on skills/training for Open Science? [YES/NO]
133.1. [IF YES] Please provide a short description of the impact story [TEXT]
133.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
133.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
133.3. Please clarify your response if relevant [TEXT]
134. [NO QUESTION] [TBD]
135. [NO QUESTION] [ANALYSIS]
136. [NO QUESTION] [ANALYSIS]

Assessment

137. Does your country have impact stories on incentives/rewards for Open Science? [YES/NO]
- 137.1. [IF YES] Please provide a short description of the impact story [TEXT]
- 137.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
- 137.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
- 137.3. Please clarify your response if relevant [TEXT]
138. How many action plans for the Agreement on Reforming Research Assessment were there in your country in [YEAR]? [NUMBER] [CoARA]
139. [NO QUESTION] [ANALYSIS]
140. [NO QUESTION] [ANALYSIS]

Engagement

141. Does your country have impact stories on citizen science? [YES/NO]
- 141.1. [IF YES] Please provide a short description of the impact story [TEXT]
- 141.2. [IF YES] Is information on this impact story available publicly on the web? [YES/NO]
- 141.2.1. [IF YES] Please provide links to the relevant webpages [TEXT]
- 141.3. Please clarify your response if relevant [TEXT]
142. [NO QUESTION] [TBD]
143. [NO QUESTION] [ANALYSIS]
144. [NO QUESTION] [ANALYSIS]

5. Conclusion

The first version of the Monitoring Framework for National Contributions to EOSC and Open Science (Version 1) consisted of 96 indicators for policies and practices. The 48 policy indicators focused on countries with a national policy, countries with a financial strategy, country RPOs with a policy, and country RFOs with a policy on categories relevant for EOSC and Open Science. The 48 practice indicators focused on countries with a national monitoring, country use cases, country investments, and country outputs for categories relevant for EOSC and Open Science. The original monitoring framework was translated into questions and piloted in Survey 2021 and implemented in Survey 2022 and Survey 2023. The survey proved successful with high response rates from the EOSC-SB. For some questions, however, it was not possible to collect reliable data whereby questions needed to be paused until data could be collected in future or be revised into new questions for which data could be collected.

The newly revised second version of the monitoring framework (Version 2) consists of 138 indicators for policies, practices, and impacts. The 48 policy indicators from Version 1 remain unchanged while some of the 48 practice indicators from Version 1 have been revised into new indicators in Version 2. The 42 new impact indicators focus on country impact stories, country output outcomes, correlation between country indicators, and yearly progress in country indicators for categories relevant for EOSC and Open Science. The revised indicators and new country impact story and country output outcome indicators in Version 2 have been translated into new questions in Survey 2024. Some questions will not be asked in Survey 2024 but will be paused until reliable data can be collected in future surveys. The new correlation and yearly progress indicators in Version 2 have not been translated into new questions in the annual survey but will be addressed in a separate analysis of the survey data.

The revised monitoring framework (Version 2) will be implemented in Survey 2024. The monitoring framework is not set in stone but will be revisited in future in collaboration with the EOSC-SB to check if the revised and new indicators and corresponding survey questions are appropriate. The monitoring framework and survey questions may thus in future be once again revised after further iterations of the annual survey depending on the needs of the EOSC-SB. The revised monitoring framework and survey results should, finally, be promoted among relevant EOSC and Open Science stakeholders including EOSC-A, UNESCO, and OSML.

References

- [1] Webpage of the EOSC Track project on CORDIS hosted by the European Commission. Link: <https://cordis.europa.eu/project/id/101148217>. Accessed 21 February 2025.
- [2] Webpage on the European Open Science Cloud hosted by the European Commission. Link: https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en#eosc-tripartite-governance. Accessed 21 February 2025.
- [3] O'Neill, Gareth (2022) *Monitoring Framework for National Contributions to EOSC*. Report of the EOSC Future project. Link: <https://zenodo.org/record/7410762>. Accessed 21 February 2025.
- [4] Webpage of the EOSC Future project on CORDIS hosted by the European Commission. Link: <https://cordis.europa.eu/project/id/101017536>. Accessed 21 February 2025.
- [5] Website of the EOSC Steering Board hosted by the European Commission. Link: <https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3756>. Accessed 21 February 2025.
- [6] EOSC Future and EOSC Steering Board (2021) *Survey on National Contributions to EOSC 2021*. Link: <https://zenodo.org/record/7423953>. Accessed 21 February 2025.
- [7] EOSC Future and EOSC Steering Board (2023) *Survey on National Contributions to EOSC 2022*. Link: <https://zenodo.org/record/7550798>. Accessed 21 February 2025.
- [8] EOSC Future and EOSC Steering Board (2024) *Survey on National Contributions to EOSC and Open Science 2023*. Link: <https://zenodo.org/record/10781735>. Accessed 21 February 2025.
- [9] Website of the European Research Area Policy Platform hosted by the European Commission. Link: <https://european-research-area.ec.europa.eu>. Accessed 21 February 2025.

[10] Website of the EOSC Open Science Observatory hosted on the EOSC Portal website by the EOSC Future project. Link: <https://eoscobservatory.eosc-portal.eu>. Accessed 21 February 2025.

[11] Webpage of the EOSC Observatory Zenodo Community hosted by Zenodo. Link: <https://zenodo.org/communities/eoscobservatory>. Accessed 21 February 2025.

[12] Website of the EOSC Association. Link: <https://www.eosc.eu>. Accessed 21 February 2025.

[13] Webpage on the EOSC Partnership hosted by the EOSC Association. Link: <https://eosc.eu/partnership>. Accessed 21 February 2025.

[14] Webpage on the FAIR Principles hosted by the GO FAIR Foundation. Link: <https://www.go-fair.org/fair-principles>. Accessed 21 February 2025.

[15] Webpage on Monitoring and Reporting for the EOSC Partnership hosted by the EOSC Association. Link: <https://eosc.eu/monitoring-reporting>. Accessed 21 February 2025.

[16] Webpage on the Additional Activities for the EOSC Partnership hosted by the EOSC Association. Link: <https://eosc.eu/monitoring-reporting/additional-activities-in-kind-contributions-to-the-eosc-partnership>. Accessed 21 February 2025.

[17] Webpage on the Key Performance Indicators for the EOSC Partnership hosted by the EOSC Association. Link: <https://eosc.eu/monitoring-reporting/eosc-partnership-monitoring-framework>. Accessed 21 February 2025.

[18] Webpage on the Monitoring Framework for the EOSC Partnership hosted by the EOSC Association. Link: https://eosc.eu/wp-content/uploads/2024/08/20240621_Draft_EOSC_Monitoring_Framework_v7_Final_Clean.pdf. Accessed 21 February 2025.

- [19] Council of Europe (2021) *Council Recommendation (EU) 2021/2122 of 26 November 2021 on a Pact for Research and Innovation in Europe*. Link: <https://eur-lex.europa.eu/eli/reco/2021/2122>. Accessed 21 February 2025.
- [20] Webpage on ERA Monitoring hosted by the European Commission. Link: <https://european-research-area.ec.europa.eu/era-monitoring>. Accessed 21 February 2025.
- [21] UNESCO (2021) *UNESCO Recommendation on Open Science*. Link: <https://unesdoc.unesco.org/ark:/48223/pf0000379949>. Accessed 21 February 2025.
- [22] Webpage on the UNESCO Open Science Working Groups hosted by UNESCO. Link: <https://www.unesco.org/en/open-science/implementation?hub=686#open-science-working-groups>. Accessed 21 February 2025.
- [23] UNESCO (2024) *First Consultation on the Implementation of the 2021 Recommendation on Open Science*. Link: <https://unesdoc.unesco.org/ark:/48223/pf0000390292>. Accessed 21 February 2025.
- [24] Website of the Open Science Monitoring Initiative. Link: <https://open-science-monitoring.org>. Accessed 21 February 2025.
- [25] Website of the OpenAIRE Graph. Link: <https://graph.openaire.eu>. Accessed 21 February 2025.
- [26] Defunct website of the EOSC Portal. Link: <https://eosc-portal.eu>. Accessed 21 February 2025.
- [27] Website of the EOSC EU Node hosted by the European Commission. Link: <https://open-science-cloud.ec.europa.eu>. Accessed 21 February 2025.
- [28] Website of the Coalition for Advancing Research Assessment (CoARA). Link: <https://coara.eu>. Accessed 21 February 2025.