MSCA-NET

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POLICY-BRIEF: OPEN SCIENCE

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TABLE OF CONTENT

D3.1 Policy Brief: Open Science

Introduction

This policy brief aims to provide a short, but comprehensive overview of the European open science policy objectives and how these have feed into shaping Horizon Europe. The brief aims to help researchers and organisations better understand the policy objectives in the context of Marie Skłodowska-Curie Actions.

The brief is not intended to duplicate or otherwise replace existing EU guidance and will bring the different information sources together and provide direct signposting to the most relevant resources.

Introduction to Open Science in Horizon Europe and MSCA

Open science (OS) is an approach to research that focuses on spreading knowledge as soon as it becomes available by facilitating an open end-to-end process using digital and collaborative techniques without access fees. It is an approach to the scientific process that is grounded in working in a collaborative manner and encourages the sharing of information as early as possible.

Open Science encapsulates several different concepts aimed at removing the barriers for sharing any kind of output, resource, method, or tool, at any stage of the research and innovation process. It enables better research by improving access to research outputs. FAIR (Findable, Accessible, Interoperable and Re-usable data) and open data sharing should become the default for the results of EU-funded scientific research.

Citizen, civil society, and end-user engagement is also considered a key aspect of the open science practise and engaging with these stakeholders is encouraged across all programme parts of Horizon Europe, including within the five EU Missions[1] (Adaptation to Climate Change, including Societal Transformation; Cancer; Healthy Ocean, Seas, Coastal and Inland Waters; Climate-Neutral and Smart Cities; Soil Health and Food).

The EU Missions aim to deliver solutions to global challenges and have active involvement of a wide range of stakeholders including citizens. Open science practices play a key role in ensuring that the challenges are solved within a defined timeframe, and many of the Mission calls have additional open science obligations.

The EU's open science policy

Open science is a policy priority for the European Commission and the standard method of working under its research and innovation funding programmes as it improves the quality, efficiency, and responsiveness of research helping to increase the diffusion of the latest knowledge. As such, the European Commission requires all beneficiaries of its' research and innovation funding to make their publications available utilising open access practises. This also extends to data following the principle 'as open as possible and as closed as necessary'. Open science practises also recognise and reward the participation of citizens and end users.

The EU's Open Science policy encapsulates 8 ambitions

1. **Open data**
   FAIR and open data sharing should become the default for the results of EU-funded scientific research
2. **European Open Science Cloud (EOSC)**
   EOSC is a trusted, virtual, federated environment to store, share, process, and reuse research objects.
3. **New generation metrics**
   Support the development new metrics that complement the conventional indicators for research quality and impact, which better recognise open science practices.
4. **Future of scholarly communication**
   All peer-reviewed publications should be made freely available (Open Access).
5. **Rewards**

[1] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe_en

Research career systems should fully acknowledge and reward open access practices.

6. **Research integrity & reproducibility of scientific results**
   An agreed standard of research integrity should be applied to all publicly funded research and all research results should be reproducible.
7. **Education and skills**
   All researchers should have the necessary open science skills.
8. **Citizen science**
   Citizens should be recognized as a producer of knowledge.

Open science under Horizon Europe

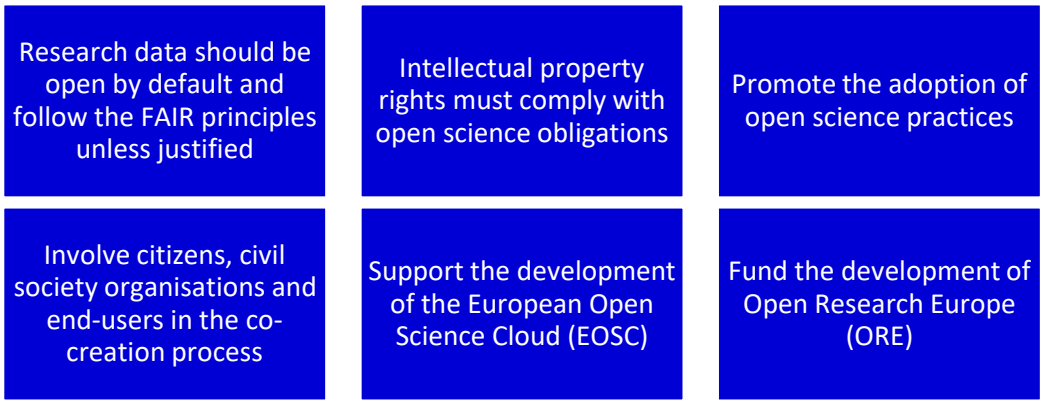
The European Union has long recognized the important role that open science has to increase access to information, enhance the quality and impact of research as well as to accelerate knowledge and innovation.

Following on from Horizon 2020, the open science policy under Horizon Europe supports the principle "as open as possible, as closed as necessary".

This is supported by specific provisions in the 'Regulation establishing Horizon Europe' and the 'Specific Programme Implementing Horizon Europe' to foster open science and support the implementation of open science practices throughout the research life cycle.

Open science practices must be promoted and encouraged across all programme parts, including for the benefit of SMEs. It must be integrated throughout all stages of the research lifecycle, including in any co-design/co-creation activities.

The aims of the open science policy under Horizon Europe



Open Science under the MSCA

Marie Skłodowska-Curie Actions (MSCA) actions fully support and encourage participating organisations and researchers to follow the principle of open science, and the FAIR data principles, unless otherwise justified. As set out in the MSCA Work Programme 2023-2024, MSCA fully endorses open science practices across the entire programme by ensuring open access to research results and outputs, as well as supporting training in open science practices. All MSCA actions are expected to promote open science practices and support a culture of open science, innovation, and entrepreneurship.

What are the requirements under the MSCA?

Explicit evaluation criteria

Applicants must provide a clear and detailed explanation of how they will comply with the mandatory Horizon Europe open science practices under the '**excellence criterion' in Part B1 section 1**. They will also need to demonstrate an awareness of all open science obligations set out in the model grant agreement. Applicants must detail the open science practices they will be utilising and explain how the

open science practice's they will be employing are integral to the methodical approach and will led to the overall success of the project.

The open science practices should be implemented throughout the project life cycle. Applicants are encouraged to think beyond the **mandatory open science practises**, such as early and open sharing of research, participation in open peer review, and involving all relevant knowledge actors.

Applicants are encouraged to think about:

- ✓ Using open knowledge sources, e.g., open data, open publications, samples etc.
- ✓ Early and open sharing of research e.g., pre-registration, registration of reports, pre-prints, crowdsourcing etc.
- ✓ Providing open access to all research results and outputs including software, models, algorithms, and workflows
- ✓ Participating in open peer review
- ✓ Involving all relevant knowledge actors including citizens, civil society, and end users in the co-creation of research and innovation agendas and contents (such as citizen science)
- ✓ Using appropriate licenses to support reusability of data and other outputs such as Creative commons, Open data Commons etc.

Open Science Practise[2]		Mandatory	Recommended
Early and open sharing of research	• Preregistration, registered reports, preprints, etc.		Yes
Research output management	• Data management plan (DMP)	Yes	
Ensure reproducibility of research outputs	• Information on outputs/tools/instruments and access to data/results for validation of publications	Yes	
Open access to research outputs through deposition in trusted repositories	• Open access to publications • Open access to data • Open access to software, models, algorithms, workflows etc.	Yes, for peer-reviewed publications and research data ('as open as possible as closed as necessary')	Yes, for other research outputs.
Participate in open peer-review	• Publish in open peer-reviewed journals or platforms		Yes
Involving all relevant knowledge actors	• Involve citizens, civil society, and end-users in co-creation of content (e.g., crowd-sourcing, etc.)		Yes

Developing skills and enhancing long term employability for staff and researchers

Beneficiaries and individual researchers are encouraged to think critically about their training needs, especially those related to open science, as promoting, and fostering open science practises is a key aim of MSCA. The quality, and novelty of the research training must be detailed under the '**excellence criterion' in Part B1**. Measures to enhance the career perspectives and employability of staff and researchers as well as contributing to their skills development must be address under the **'impact criterion' in Part B1 section 2**.

[2] Non-exhaustive list of open science practices. Open science practices are listed in the template for proposals and call specific requirements will be included in the call text.

Additional resources and/or training may be required to help address issues related to open science and the associated costs can be claimed from the institutional unit costs. Moreover, any costs associated with implementing the Data Management Plan, or utilising open science practices, including the costs for open access publications, can also be claimed from the institutional unit costs. Please note that for COFUND cost eligibility is determined at a project level.

Planning your dissemination, exploitation, and communication activities

Applicants must plan their dissemination, exploitation, and communication activities carefully, keeping in mind the open science obligations set out in the Model Grant Agreement (MGA). The activities must be clearly explained under the **'Impact criterion' in Part B1 section 2**.

Beneficiaries will need to submit a detailed dissemination and exploitation plan along with a plan for communication activities as set out in the grant agreement. Open science practices as part of the dissemination, exploitation, and communication activities will encompass the use, ownership, and access results.

Open access to generated research data is required under the premise 'as open as possible as closed as necessary'. Beneficiaries must also ensure open access to peer-reviewed scientific publications resulting from project outputs.

Further information on dissemination and exploitation under Horizon Europe, including specific resources for MSCA, can be found on the European Executive Agency Website.

Host organisation(s) experience of open science practices

Participating organisations must also explain their expertise of open science under the '**Quality and efficiency of implementation criterion**' **in Part B2 section 5** and where relevant under **Part B1 section 3**.

Open Research Europe

Open Research Europe (ORE) open access publishing platform was launched in March 2021.

It is free of charge for the authors and beneficiaries.

Ahigh-quality, reliable, and efficient open access publishing venue for EU-funded research across all subject disciplines.

Though it is not a requirement, using this platform makes it easier for beneficiaries of Horizon Europe and Euratom funded research to comply with the EC open access policy requirements.

ORE contains a dedicated section (gateway) of articles stemming from MSCA funded projects.

In Part A, applicants are asked to list up to five relevant publications, widely used datasets or other achievements of consortium members that they consider significant for the action proposed. Publications are encouraged to follow open science practices and datasets are expected to follow the FAIR principle.

Organisations must comply with the Grant Agreement

Beneficiaries and other participating organisations must comply with the open science obligations set out in Annex 5, of the Horizon Europe MGA. They must also ensure that the researchers involved in MSCA funded projects are aware of these obligations. If necessary, support and guidance must be provided to help the researchers understand and follow open science practices, including the FAIR data principles.

Annex 5 of the MGA: COMMUNICATION, DISSEMINATION, OPEN SCIENCE AND VISIBILITY (— ARTICLE 17)	
Obligation	**Description**
Open science: open access to scientific publications	Beneficiaries must ensure open access to peer-reviewed scientific publications relating to their results. Beneficiaries (or authors) must retain sufficient intellectual property rights to comply with the open access requirements.
Open science: research data management	Beneficiaries must manage the digital research data generated in the action in line with the FAIR principles. Beneficiaries must develop a data management plan and regularly update it.
Open science: additional practices	Where a call imposes additional obligations, these must be complied with by the beneficiary.

Beneficiaries must develop a Data Management Plan

Beneficiaries must produce a data management plan (DMP), which describes the way in which data is collected, processed, generated, and stored during the project life cycle. The DMP is a living document which should be updated throughout the implementation of the project. As specified in the grant agreement, beneficiaries may need to submit a DMP as a deliverable at different timings depending on the individual action. The beneficiaries will also need to provide an updated DMP deliverable as set out in the grant agreement and where relevant, at the end of the project. Beneficiaries are strongly encouraged to think about the development of the data management plan as early as possible.

All **DMP's** should include:

- ✓ A description of the data set(s).
- ✓ The protocols, standards and metadata used.
- ✓ The unique and persistent identifies of the data set(s).
- ✓ Information used to ensure the integrity of the data set(s)
- ✓ The period for which the data set(s) will be maintained.
- ✓ Information on the data sharing methodology.
- ✓ Output management.
- ✓ The personnel responsible for the DMP and quality assurance process.
- ✓ An estimation of the costs for developing and maintaining the DMP.

WHAT IS RESEARCH DATA?

Research data is any information that is collected, observed, created, or generated. It is used to corroborate research findings (results). Research data can take many forms including both digital and non-digital formats. Data can include but are not limited to:

- Documents
- Spreadsheets
- Laboratory notebooks
- Field notebooks
- Diaries
- Questionnaires
- Transcripts
- Codebooks
- Archival material
- Photographs
- Films
- Slides
- Artefacts
- Specimens
- Database contents
- Models, algorithms
- Scripts
- Software etc.

References and Resources

- **Horizon Europe and MSCA**
  - Regulation establishing Horizon Europe
  - Specific programme implementing Horizon Europe
  - Horizon Europe Strategic Plan (2021-2024)
  - MSCA Work Programme 2023-2024
  - Horizon Europe Model Grant Agreement
  - MSCA Model Grant Agreement
  - The European Research Area (ERA)

- **Addressing open science in a research and innovation proposal**
  - MSCA-NET handbooks
  - OpenAIRE
  - FOSTER
  - Horizon Europe Programme Guide
  - EC FAQ's on open science

- **Guidance on developing a Data Management Plan (DMP)**
  - Horizon Europe data management plan template
  - RDA Metadata Standards Catalogue
  - Registry of research data repositories
  - Digital Curation Centre DMP online tool

- **EC Open Science Policy**
  - Open Science

- **EC Webinars on open science**
  - A successful proposal for Horizon Europe: Scientific-technical excellence is key, but don't forget the other aspects
  - European Commission's OS webinar presentation
  - How to evaluate Open Science in Horizon Europe proposals
  - Exploitation & Open science in Horizon Europe