Open Science in Horizon Europe

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Summary:

1. Introduction to open science
2. Horizon Europe Program
3. Evaluation of open science in Horizon Europe grant proposals
4. Criteria and requirements for open science practices in Horizon Europe calls for proposals
   • Open Access
   • FAIR Data and metadata
   • Data management plan (DMP)
   • Trusted data repository
   • Citizen science
What is Open Science?

“Open Science refers to the unhindered dissemination of results, methods and products by recent digital progress to develop open access to publications and – as much as possible – data, source code and research methods. It is a means for publicly funded research projects to retain control over the results they produce”

Second French Plan for Open Science (2021-2024)

Image: https://www.ouvrirlascience.fr/deuxieme-plan-national-pour-la-science-ouverte/
Why we need Open Access?

@by Patrick Hochstenbach
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Immediate open access to publications, without embargo

Découvrir des revues en libre accès sur DOAJ (Directory of Open Access Journals) : https://doaj.org/

Savoir si une revue est compatible avec les exigences des financeurs : https://journalcheckertool.org/
LA SCIENCE OUVERTE À L'UNIVERSITÉ PARIS-SACLAy

1. Libre accès
   - Faire du libre accès la règle pour l'ensemble des publications scientifiques de l'Université
   - Encourager la science participative dans des projets de recherche de l'Université
   - Valoriser, diffuser et promouvoir la science participative

2. Données FAIR
   - Promouvoir la FAIRisation et l'ouverture des données de la recherche produites au sein de l'Université Paris-Saclay
   - Facile à trouver, accessible, interopérable, réutilisable

3. EOSC
   - Contribuer à l'European Open Science Cloud
   - Développer les compétences
   - Maîtriser les compétences techniques nécessaires au partage des résultats et méthodes de la recherche

4. Intégrité
   - Participer à la promotion de l'intégrité scientifique à travers la science ouverte
   - Encourager l'usage de nouveaux indicateurs pour mieux prendre en compte l'ouverture de la science dans l'analyse de la production scientifique de l'Université

5. Récompenser et encourager
   - Mieux intégrer les pratiques de science ouverte dans l'évaluation des chercheurs
   - Remise de prix...

- Être conscient des enjeux du libre accès
2. Horizon Europe (2021-2027): European research and innovation funding programme

Budget: 100 billion euros to strengthen innovation and research in Europe

Details per pillar

About Horizon Europe

Horizon Europe supports research and innovation through Work Programmes, which set out funding opportunities for research and innovation activities.
Pillar I

EXCELLENT SCIENCE:

reinforcing and extending the excellence of the Union's science base

<table>
<thead>
<tr>
<th>European Research Council</th>
<th>Marie Skłodowska-Curie Actions</th>
<th>Research Infrastructures</th>
</tr>
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<tbody>
<tr>
<td>Frontier research by the best researchers and their teams</td>
<td>Equipping researchers with new knowledge and skills through mobility and training</td>
<td>Integrated and interconnected world-class research infrastructures</td>
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| €16 billion | €6.6 billion | €2.4 billion |

Pillar II - Clusters

GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS:

boosting key technologies and solutions underpinning EU policies & Sustainable Development Goals (6 clusters and JRC – non-nuclear direct actions)

€53.5 billion

Pillar III

INNOVATIVE EUROPE:

stimulating *market-creating breakthroughs* and *ecosystems* conducive to innovation

<table>
<thead>
<tr>
<th>European Innovation Council</th>
<th>European innovation ecosystems</th>
<th>European Institute of Innovation and Technology (EIT)</th>
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<tr>
<td>Support to innovations with breakthrough and market creating potential</td>
<td>Connecting with regional and national innovation actors</td>
<td>Bringing key actors (research, education and business) together around a common goal for nurturing innovation</td>
</tr>
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The budget: **€10.6 billion**, incl. up to **€527 million** for ecosystems (including NGEU – Recovery Fund parts dedicated to EIC).

**circa €3 billion**

Part

Widening Participation & Strengthening the European Research Area (ERA):

Widening Participation and Spreading Excellence

- Teaming, Twinning, ERA Chairs,
- European Cooperation in Science and Technology (COST)
- Boosting National Contact Points’ (NCPs) activities, pre-proposal checks and advice
- Brain circulation
- Excellence initiatives:
- Possibility for entities from widening countries to join already selected collaborative R&I actions
- Recognition of participation
- Matchmaking services

Reforming and enhancing the EU R&I system

- Strengthening the evidence base for R&I policy
- Foresight
- Support for policy makers to the ERA development
- Support to national R&I policy reform, including Policy Support Facility
- Attractive researcher careers and links with higher education
- Open science, citizen science and science communication
- Gender equality
- Ethics and integrity
- Support to international cooperation
- Scientific input to other policies
- Support to the Programme implementation
- Support for National Contact Points
- Support to dissemination & exploitation

€2.96 billion

€0.44 billion

General context of open science in Horizon Europe

• « Horizon Europe Programme Guide », 58p, version 2.0, April, 2022. (OS: “Open science in Horizon Europe”, pp.38-54.)


• « HORIZON EUROPE. PROPOSAL EVALUATION. Standard Briefing ». Version 3.0. 18.03.2022
How to evaluate open science in a Horizon Europe call for proposals?
Open Science is a requirement of scientific methodology in the assessment of "Excellence", "Impact", and "Quality of Implementation" of a call for proposals.

Evaluation (award) criteria

Three evaluation criteria

'Excellence', 'Impact' and 'Quality and efficiency of the implementation'.

(Only one evaluation criterion for ERC - Excellence)

- Evaluation criteria are adapted to each type of action, as specified in the WP.
- Each criterion includes the 'aspects to be taken into account'. The same aspect is not included in different criteria, so it is not assessed twice.
- Open Science practices are assessed as part of the scientific methodology in the excellence criterion.
Evaluating the excellence criterion (2/2)

Assess the scientific methodology:

- Is the scientific methodology (i.e. the concepts, models and assumptions that underpin the work) clear and sound?
- Is it clear how expertise and methods from different disciplines will be brought together and integrated in pursuit of the objectives? If applicants justify that an inter-disciplinary approach is unnecessary, is it credible?
- Has the gender dimension in research and innovation content been properly taken into account?
- **Are open science practices implemented as an integral part of the proposed methodology?**
- Is the research data management properly addressed?
- For topics indicating the need for the integration of social sciences and humanities, is the role of these disciplines properly addressed?
Evaluating the Quality of implementation (2/2)

Assess the quality of participants and the consortium as a whole:
(Note that important information on role of individual participants and previous experience is included in part A of proposal)

- Does the consortium match the project’s objectives, and bring together the necessary disciplinary and inter-disciplinary knowledge.
- **Does the consortium include expertise in open science practices**, and gender aspects of R&I, as appropriate?
- For topics flagged as SSH relevant, does the consortium include expertise in social sciences and humanities?
- Do the partners have access to critical infrastructure needed to carry out the project activities?
- Are the participants complementing one another (and cover the value chain, where appropriate)
- In what way does each of them contribute to the project? Does each of them have a valid role, and adequate resources in the project to fulfil that role (so they have sufficient operational capacity)?
- Is there industrial/commercial involvement in the project to ensure exploitation of the results?

Participants’ previous publications, in particular journal articles, are expected to be open access and existing datasets **FAIR** and ‘as open as possible, as closed as necessary’. Evaluate positively if this is sufficiently addressed.

Evaluating the impact criterion (2/2)

Assess the measures to maximise impact – Dissemination, exploitation and communication:

- Are the proposed dissemination, exploitation and communication measures suitable for the project and of good quality? All measures should be proportionate to the scale of the project, and should contain concrete actions to be implemented both during and after the end of the project.

- Are the target groups (e.g. scientific community, end users, financial actors, public at large) for these measures identified?

- Is the strategy for the management of intellectual property properly outlined and suitable to support exploitation of results?
  - If exploitation is expected primarily in non-associated third countries, is it properly justified how that exploitation is still in the Union’s interest?
3. Open Science Criteria in Horizon Europe

Open science is an approach based on open cooperative work and systematic sharing of knowledge and tools as early and widely as possible in the process, including active engagement of society.

Open science practices include:
- Early and open sharing of research (for example through preregistration, registered reports, pre-prints, or crowd-sourcing).
- Research output management including research data management (RDM).
- Measures to ensure reproducibility of research outputs.
- Providing open access to research outputs (e.g. publications, data, software, models, algorithms, and workflows) through deposition in trusted repositories.
- Participation in open peer review.
- Involving all relevant knowledge actors including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science).

Mandatory OS practices
- Mandatory in all calls: Open access to publications; RDM in line with the FAIR principles including data management plans; open access to research data unless exceptions apply (‘as open as possible as closed as necessary’); access and/or information to research outputs and tools/instruments for validating conclusions of scientific publications and validating/re-using data.
- Additional obligations specific to certain work programme topics. Reflect both in lower score when not sufficiently addressed.

Recommended OS practices
- All open science practices beyond mandatory.
- Evaluate positively when sufficiently addressed.

When OS practices (mandatory and recommended) are duly justified as not appropriate for the project, do not lower score for not addressing those practices.

Detailed guidance for proposers and evaluators in the HE Programme Guide.
Criteria for publication

• Beneficiaries must ensure that at the latest at the time of publication, open access is provided via a trusted repository to the published version or the final peer-reviewed manuscript accepted for publication under the latest available version of the Creative Commons Attribution International Public Licence (CC BY) or a licence with equivalent rights.

• Beneficiaries are required to retain sufficient intellectual property rights (IPR) to comply with their open access obligations. Authors may need to interact with prospective publishers, in particular when they publish in venues that are not open access.

• Publication fees are only eligible when publishing in full open access publishing venues (venues in which the entire scholarly content is openly accessible to all) and not hybrid venues.

Open data: an issue of open science

https://fr.freepik.com/photos-vecteurs-libre/affaires
Why a good data management is important?

- Preservation
- Replicability
- Innovation
- Collaboration
- Valuation

Image from the Aalto University's webinar series on “Research data management”.
“Research data” are defined as factual records (numerical scores, textual records, images and sounds) used as primary sources for scientific research, and that are commonly accepted in the scientific community as necessary to validate research findings. »


Classification of research data:

* According to nature or form:
  - Texte
  - Digital
  - Multimedia
  - …

* According to level of elaboration:
  - Primary data
  - Processed data
  - Analyzed data
‘As open as possible, as closed as necessary’

• Non-anonymized personal data
• Data that we do not own
• Data resulting in a patent application
• Data whose dissemination poses security issues
FAIR Data and metadata
Criteria for data and metadata

• The metadata associated with the publications must be open access with a CCO license (Creative Common Public Domain Dedication) or equivalent, in order to ensure their reuse.

• Metadata of deposited publications must be open under a Creative Common Public Domain Dedication (CC0) or equivalent, in line with the FAIR principles (in particular machine-actionable) and provide information at least about the following:
  • publication (author(s), title, date of publication, publication venue);
  • Horizon Europe or Euratom funding;
  • grant project name, acronym and number;
  • licensing terms;
  • persistent identifiers for the publication, the authors involved in the action and, if possible, for their organisations and the grant.

Recommandations:

It is important to provide persistent identifiers (PIIDs) for the dataset.

- DOI (Digital object identifier) or identifier Handle
- ORCID or ResearcherID
- If possible, ROR ID for granting organizations
- Metadata is machine-readable and standardized (e.g. Dublin Core, Data Cite, etc.). Preferably, common non-proprietary formats can be used respecting the standards of each scientific community.
Data Management Plan (DMP)

https://fr.freepik.com/photos-vecteurs-libre/medias-sociaux
What is DMP?

- a written document that describes the data life cycle
- A planning document
- An ‘evolving’ and living document

One objective: to reassure funders!
Content of Horizon Europe DMP

→ Data summary
→ FAIR Data
→ Other research outputs
→ Allocation of resources
→ Data security
→ Ethical aspects
→ Other issues
Criteria for DMP

- Establish a data management plan (“DMP”) (and update it regularly)

- Take into account that the data must be reusable in the data management plans (DMP)

- Beneficiaries are encouraged to manage their data in accordance with the FAIR principles.

- Respecting the principle “as open as possible, as closed as necessary”

Recommandation : DMP Writing tools

• Viewing DMPs :
  • DMP Templates (dmptool.org)
  • https://dmponline.dcc.ac.uk/public_plans
  • Modèles de DMP (opidor.fr)
Trusted data repository

Criteria for trusted repositories

Beneficiaries must ensure that research data is deposited in certified repositories or archives. Certification standards to be met include:

- Certified repositories (e.g. CoreTrustSeal, nestor Seal DIN31644, ISO16363)

- disciplinary and domain repositories commonly used and endorsed by the research communities. Such repositories should be recognised internationally

- facilitate mid- and long-term preservation of the deposited material
Recommandation : Deposit your data in a trusted repository

- Generalist/Disciplinary?

Find a repository: re3data, FAIRsharing
- re3data (Registry of Research Data Repository)
- FAIRSharing.org : https://fairsharing.org/ (find metadata stand)

- Licenses attribution
  - Creative Commons, Etalab, ODbL
  - Choose a licence

- Assign a PID = Persistent identifiers
  - DOI for data and dataset/ORCID ID for author
Recherche.Data.gouv.fr : French national repository for open research data

https://recherche.data.gouv.fr/fr
Citizen science

Image: « UNESCO Recommendation on Open Science », 2021
Example of a citizen science project at Université Paris-Saclay

Image: https://www.vigienature.fr/fr/vigie-manip/birdlab
Engagement des citoyens, de la société civile et des utilisateurs finaux dans un *proposal*

“Citizen and civil society engagement is a programme principle and operational objective that refers to the opening up of R&I processes to society to develop better, more innovative and more relevant outcomes, and to increase societal trust in the processes and outcomes of R&I.”

**Co-design activities:** “workshops, focus groups, deep discussion on the implications, the benefits and the challenges related to R&I courses of action or technology development”.

**Co-creation activities:** “citizen science or user-led innovation, involve citizens or end-users directly in the development of new knowledge or innovations, through a range of different levels of participation”.

**Co-assessment activities:** “assisting in the monitoring and evaluation of the progress of a project.”

« Horizon Europe Programme Guide », version 2, April 2022. (OS: “Open science in Horizon Europe”, p.51.)
Sources

• « Horizon Europe Programme Guide », 58p, version 2, April 2022. (OS: “Open science in Horizon Europe”, pp.38-54.)


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• https://www.horizon-europe.gouv.fr/
Thank you!

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