Open Science in Horizon Europe

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MUNI Grants Week
12 October 2021

Why do we need Open Science?

*"**Open science**" means an approach to the scientific process based on open cooperative work, tools and diffusing knowledge*

(Horizon Europe Regulation and Model Grant Agreement)

- Open science has the potential to increase

  - **Quality & efficiency of R&I**, if all the produced results are shared, made reusable, and if their reproducibility is improved

  - **Creativity**, through collective intelligence and cross-disciplinary research that does not require laborious data wrangling

  - **Trust** in the science system, by engaging both researchers & citizens

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Towards a new modus operandi for Science

The dominant current system   **FROM → TO**   **Open Science**

- Rewarding individual competing scientists
- Publish as much and as fast as possible

- Excellence defined largely on the basis of *where* scientists publish

- Incentivises researchers to *produce specific outputs* (mainly publications)

  - *Use of quantitative metrics*

- Increasing influence of commercial players from access to publications

  - *supported by proprietary services and analytics*

→

- Rewarding collaboration and sharing
- Share knowledge/data as early and as openly as possible

- Composite definition of excellence

- Incentivises researchers to share, collaborate, increase quality and impact;

  - *Use of qualitative and quantitative metrics*

- Avoid lock-in over public-funded R&I output, ensuring autonomy of research performing organisations

  - *supported by open services and analytics*

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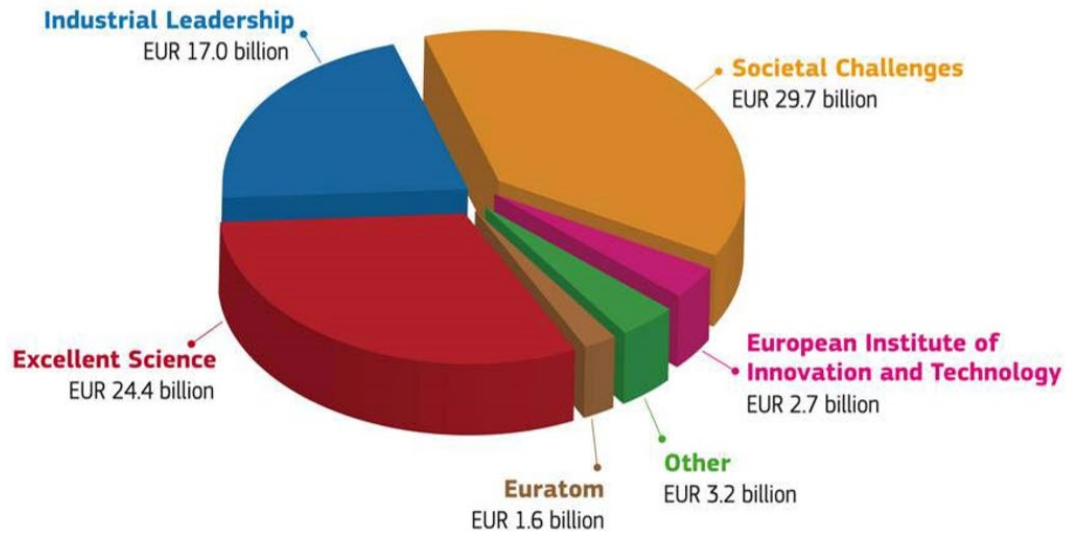
Improving the research assessment system

The Commission **is currently consulting** research funders, research performers, policy makers, and other stakeholders, **on how to advance with reforming the research assessment system**.

- A proposed way forward is to **reach an agreement by 2022** (such as a Memorandum of Understanding) **between those willing to reform the current research assessment system**, which would be signed by an increasing number of funders and research performing organisations.

  ➢ Agreement setting commonly agreed objectives, principles and actions, and engaging signatories to translate commitments into effective changes;

  ➢ For a more qualitative assessment of research, researchers and institutions, that considers the value and impact of a diversity of outputs and research cultures, and that incentivizes open collaboration and knowledge and data sharing.
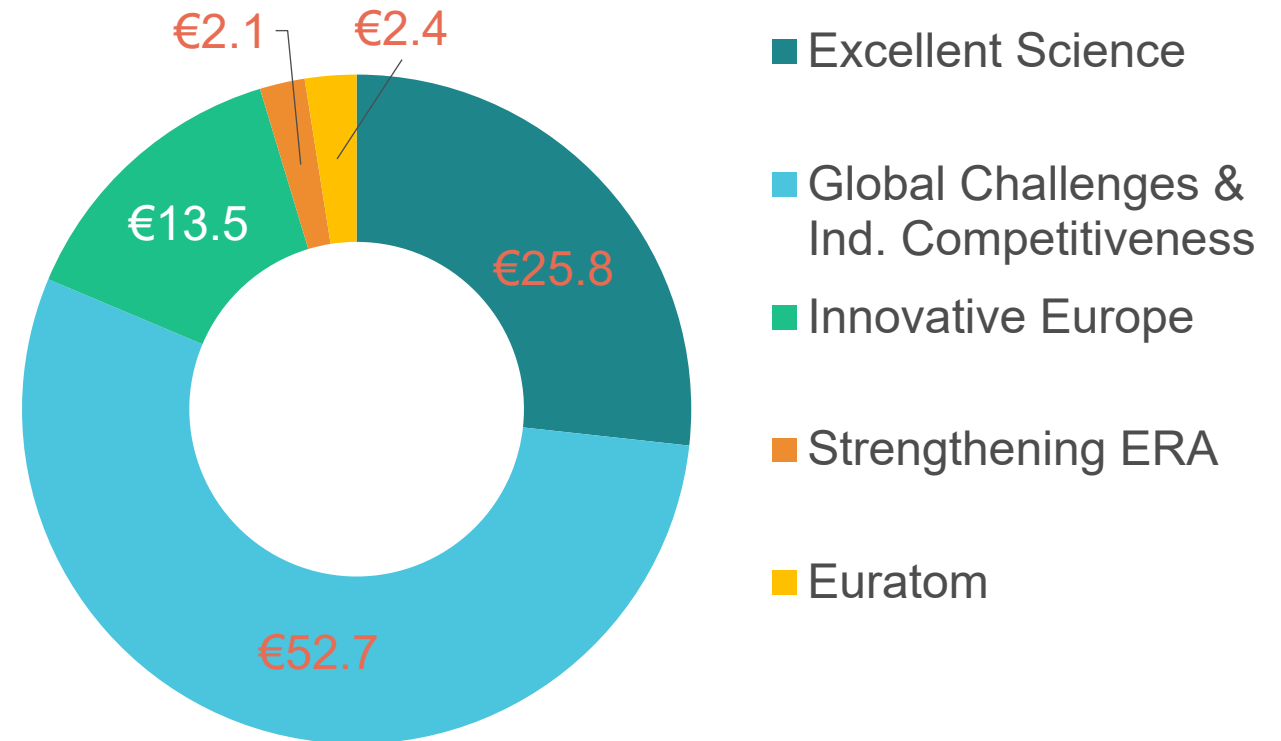
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Open Science in Horizon Europe

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Horizon 2020 & Horizon Europe

Horizon 2020: ~ €80bn

Industrial Leadership
EUR 17.0 billion

Societal Challenges
EUR 29.7 billion

Excellent Science
EUR 24.4 billion

European Institute of
Innovation and Technology
EUR 2.7 billion

Euratom
EUR 1.6 billion

Other
EUR 3.2 billion

Horizon Europe: ~€95.5bn

€2.1 €2.4

€13.5

€25.8

€52.7

- Excellent Science
- Global Challenges & Ind. Competitiveness
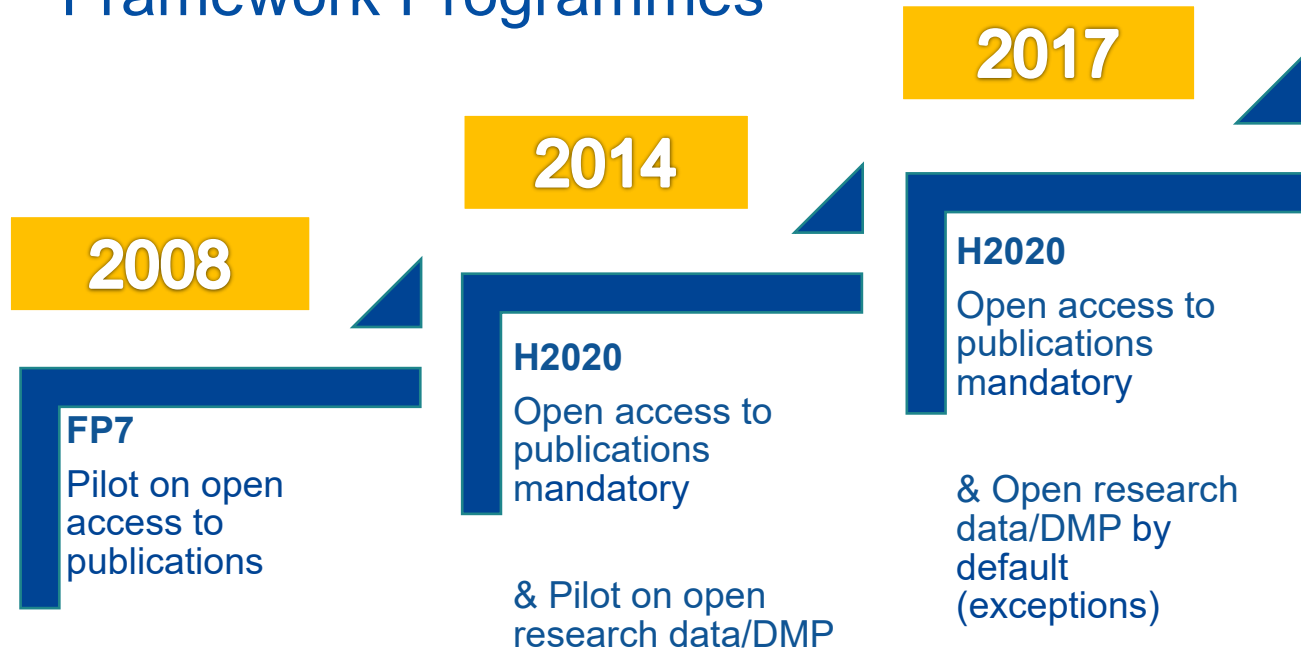- Innovative Europe
- Strengthening ERA
- Euratom

- The Commission invests heavily in Research and Innovation.
- Over **30000 H2020 projects**—Projects produce **research outputs**, **data**, **deliverables**, etc.
- It becomes increasingly important to make the **best possible use** of previous work.

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Main novelties in Horizon Europe

- **Rationale and scope:** move from open access to open science with a broadened scope of policy; open science comprises open science practices

- **Evaluation:** open science under excellence (not impact); practices beyond mandatory incentivized through evaluation; publications evaluated on basis of qualitative assessment provided (not Journal Impact Factor)

- **Intellectual Property Rights:** requirement to maintain enough rights to meet open access requirements to publications

- **Publications:** Immediate open access (=no embargo); only publication fees in full open access venues are reimbursable (=no hybrids)

- **Research data:** research data management (including data management plans) mandatory for all projects generating and/or reusing data; open access 'as open as possible as closed as necessary'

- **Qualified open access to research outputs:** specific licenses and technical standards for digital objects to enable FAIR; trusted repositories

- **Reproducibility of research:** information for validation of publications and for validation and reuse of data required; access for validation of publications must be provided (while legitimate interests safeguarded)

- **Open science and public emergencies:** immediate open access to all research outputs (non-exclusive licenses under fair and reasonable conditions to the relevant legal entities if open access not possible)

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Open Science in Horizon Europe

Evolution of Open Science policies across Framework Programmes

2008

FP7
Pilot on open access to publications

2014

H2020
Open access to publications mandatory

& Pilot on open research data/DMP

2017

H2020
Open access to publications mandatory

& Open research data/DMP by default (exceptions)

Under **Horizon Europe (2021)**

- Open Science embedded across Horizon Europe

- Strengthening of the open access obligations and focus on responsible research data management in line with the FAIR principles

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Open Science throughout project lifetime

Monitoring
Reporting (during and at the end of project)

Proposal submission
evaluation of Open Science practices

Project phase
Implementation of description of action

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Evaluating open science in Horizon Europe proposals

Open Science practices

What?	How?	Mandatory in all calls/recommended
Early and open sharing of research	Preregistration, registered reports, preprints etc.	Recommended
Research output management	Manage responsibly in line with FAIR; Data management plan (DMP)	**Mandatory**
Measures to ensure reproduciblity of research outputs	Information on outputs/tools/instruments and access to data/results for validation of publications	**Mandatory**
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.	• **Mandatory** for peer-reviewed publications • **Mandatory** for research data **but** with exceptions ('as open as possible…') • Recommended for other research outputs
Participation in open peer-review	Publishing in open peer-reviewed journals or platforms	Recommended
Involving all relevant knowledge actors	Involvement of citizens, civil society and end-users in co-creation of content (e.g. crowd-sourcing, etc.)	Recommended

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Evaluation of proposals and Open Science

"Excellence" criterion

(methodology)

"Quality and efficiency of implementation" criterion

(capacity of participants and consortium as a whole + list of achievements)

- Evaluation of the quality of open science practices

- E.g.1 page to describe Open Science practices + 1 page to describe research data/output management [RIA,IA]

- Explain expertise/track record on Open Science

- List publications, software, data, etc, relevant to the project with qualitative assessment and, where available, persistent identifiers

Publications are expected to be open access; datasets are expected to be FAIR and 'as open as possible, as closed as necessary'. **Significance of publications to be evaluated on the basis of proposers' qualitative assessment** and not per Journal Impact Factor

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Model Grant Agreement requirements

1. Open access to scientific publications

2. Research Data Management

3. Additional open science practices

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1. Open access to publications (1/2)

Beneficiaries must ensure **open access to peer-reviewed scientific publications** relating to their results. In particular, **they must ensure**:

❑ at the latest upon publication, **deposition** of the Author Accepted Manuscript or Version of Record in a trusted repository + **immediate open access via the repository** under a Creative Commons Attribution license (CC BY) or equivalent (Creative Commons Attribution Non Commercial/Non Derivatives licenses or equivalent are allowed for long-text formats)

❑ **information** via the repository about any research output/tools/instruments needed to **validate the conclusions of the scientific publication**

Metadata must be open under a Creative Commons Public Domain Dedication (CC 0) or equivalent, **in line with the FAIR principles** and provide information about the licensing terms and persistent identifiers, amongst others.

Open access to publications (2/2)

➢ Beneficiaries (or authors) **must retain sufficient intellectual property rights** to comply with the open access requirements

➢Publication in venue of their choice but **publication fees are reimbursable only if publishing venue is full open access** (publication fees in hybrid venues are not reimbursed)

➢Beneficiaries have the possibility to publish at no costs in **Open Research Europe**, the European Commission open access publishing platform

Open Research Europe (ORE)
the open access publishing platform of the European Commission

- ORE is **not a repository**

- **Original** articles i.e. stemming from Horizon 2020-funded research and Horizon Europe

- **All scientific areas** of Horizon 2020 and Horizon Europe covered

- **High-quality, reliable and efficient** publishing venue

- **High scientific standards**, and **swift and transparent processes**

- Oversight by an **independent Scientific Advisory Board**

Visit the platform: https://open-research-europe.ec.europa.eu/

@OpenResearch_EU

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Benefits

EFFICIENT

Open science in action

IMPACTFUL

Rigorous open peer review

Rapid and transparent

International scientific advisory board

Immediate open access

Article-level metrics

Open data for reproducibility and reuse

STRESS-FREE

Service available also after grant has ended

Optional service

No author fees

No administrative burden

Automatic compliance with open access requirements

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2. Research data management (1/2)

Beneficiaries **must manage the digital research data** generated in the action responsibly, **in line with the FAIR ("Findable", "Accessible", "Interoperable", Reusable")** principles and:

- ☐ establish + regularly update a **data management plan** ('DMP') for generated (and/or collected) data

- ☐ as soon as possible and within the deadlines set out in the DMP, **deposit** the data in a trusted repository (federated in the EOSC if required in the call conditions) **+ ensure open access under CC BY, CC 0 or equivalent, following the principle 'as open as possible as closed as necessary'**

- ☐ provide information via the repository about any research output/tools/instruments needed to **re-use or validate the data**

Metadata must be open under CC 0 or equivalent (to the extent legitimate interests or constraints are safeguarded), **in line with the FAIR principles** and provide information about the licensing terms and persistent identifiers, amongst others.

Research data management (2/2)

There are exceptions to open access to research data.

Data may be kept closed if:

- providing open access is against the **beneficiary's legitimate interests**, including regarding commercial exploitation;

- it is contrary to **any other constraints**, such as data protection rules, privacy, confidentiality, trade secrets, Union competitive interests, security rules, intellectual property rights or would be **against other obligations** under the Grant Agreement.

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Trusted repositories under Horizon Europe

- Trusted repositories are either **certified repositories** (e.g. CoreTrustSeal, nestor Seal DIN31644, ISO16363) and/or **disciplinary/domain repositories** that are commonly used/endorsed by the research communities (e.g. ELIXIR deposition databases).

- **General-purpose repositories** and **institutional repositories** are, in general, also acceptable.

- Trusted repositories share essential properties:

  - Mechanisms to ensure **integrity** and **authenticity** of contents.

  - Offer clear **information** about their **policies/services**.

  - Provide broad, and ideally **open access** to content (consistent with legal and ethical constraints).

  - Assign **PIDs**, ask for detailed **metadata** in a standardized (e.g. Dublin Core) and machine-readable way.

  - Ensure mid- and long-term **preservation** of contents, **expert curation**, **quality assurance**.

  - Meet national and/or international **security** criteria

3. Additional Open Science practices

- Where the call conditions impose **additional obligations** regarding Open Science practices, the beneficiaries must also comply with those

- Where the call conditions impose **additional obligations regarding the validation of scientific publications**

    beneficiaries must provide <u>(digital or physical) access</u> to data or other results needed for validation of the conclusions of scientific publications, <u>to the extent that</u> their legitimate interests or constraints are safeguarded (and unless they already provided the (open) access at publication)

- Where the call conditions impose **additional Open Science obligations in case of a public emergency,**

    beneficiaries must (if requested by the granting authority) immediately deposit any <u>research output</u> in a repository + provide open access to it under CC BY, CC 0 or equivalent

As an exception, <u>if the access would be against the beneficiaries´ legitimate interests</u>, the beneficiaries must grant nonexclusive licenses –under fair and reasonable conditions- to legal entities that need the research output to address the public emergency and commit to rapidly and broadly exploit the resulting products and services at fair and reasonable conditions. This provision applies up to 4 years after the end of the action

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https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/reference-documents;programCode=HORIZON

Open Science in Horizon Europe explained

- Webinar: [How to prepare a successful proposal in Horizon Europe](#) (24 March 2021)

  - Open Science at 00:53:00

  - Q&A (including on Open Science) from 1:09:00

- Webinar: [A successful proposal for Horizon Europe: Scientific-technical excellence is key, but don't forget the other aspects](#) (21 April 2021)

  - Presentation: [Open Science](#)

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Thank you!

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