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Factsheet on

Open Access in Horizon 2020

May 2017

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1 Background information

1.1 What is Open Access?

"Open Access" (OA) stands for the practice of providing online access to scientific information that is publicly accessible, free of charge and reusable. With regard to research and innovation, "scientific information" include

1. peer-reviewed **scientific research articles** (published in academic journals),

   as well as

2. **research data** (data underlying publications, curated data, raw data)

Researchers and research institutions have initiated the OA movement at international level. The "Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities" of 2003 is a first milestone in the area of open access. This declaration not only mentions basic rights such as reading, downloading and printing of scientific texts, but also the right to copy, disseminate, search and link as well as data crawling and data mining.

In practice, the transition to OA as standard of publication comprises two steps: **storing of publications in repositories/online archives** and **providing free access to these data**. OA can be provided via two strategies:

- **'Gold' open access (Open Access publishing):** first publication of articles, monographs, anthologies, etc. in an OA journal or by an OA publisher. Usually, publication fees incur for **gold open access publications.**

- **'Green' open access (self-archiving):** simultaneous or subsequent archiving of the published article or the final peer-reviewed manuscript in an (institutional or subject-specific) online repository. Usually, there are no direct costs for the author.

The so-called **'hybrid' publication model** is a mixed form of publishing. In addition to the traditional publication in a paid journal, an OA version of a text is published for a corresponding fee. Institutions often consider this publication model unfavourable because it implies paying twice, namely subscription fees (for the journal) and publication fees (for the OA publication of their researchers' articles).

1.2 Why Open Access? The objectives of the European Commission

The European Commission's support to OA is based on the vision of the **widest possible and sustainable dissemination and use of research results funded by public resources**. Consequently, OA serves as an instrument that improves the public access to scientific information. The European Commission anticipates numerous **positive effects**:

- Higher quality of research results by building on existing scientific publications and data
- Improved efficiency in the European Research Area (ERA) by increasing cooperation and prevention of duplication of efforts
- Accelerated innovation in the private and public sector by rapid and transparent access to actual scientific ideas and findings

Therefore, the objective of the European Commission is to make publicly funded scientific results available online without any additional costs. These results should be made available for other researchers within the research community as well as for policy makers, companies and the general public.

After a pilot action in the Seventh Framework Programme for Research and Technological Development (FP7), **OA was anchored as a general principle in the actual EU Framework Programme for Research and Innovation Horizon 2020**. In principle, scientific publications in the context of a project funded by Horizon 2020 must be provided free of charge and publicly accessible online. This condition does not imply an obligation for beneficiaries to publish results. However, it is binding if scientific publication is chosen as a means of disseminating project results.

OA is embedded in the wider context of the so-called **'3-O-Strategy'**, which is an essential part of the current EU policy in the field of research an innovation. This strategy summarises the three priorities of the EU Commissioner for Research, Science and Innovation, Carlos Moedas, in a political agenda: "Open Science, Open Innovation, Open to the World" (see Figure 1[1]). OA is one of the aspects in the field of **"Open Science"**. Open Science refers to the multitude of opportunities and impacts the digital/web-based technology offers for research and aims at making scientific processes as open, transparent and reusable as possible. Thus, new means of production and use of scientific findings should be established for the scientific community as well as for companies and society. This might be achieved by an improved reproducibility of research results and an easier knowledge transfer among different actors in the field of innovation.

Figure 1: Publication „Open Innovation – Open Science – Open to the World" of the European Commission

[1] see https://ec.europa.eu/digital-single-market/en/news/open-innovation-open-science-open-world-vision-europe

2 Implementation of Open Access in Horizon 2020

2.1 Open Access publications in Horizon 2020

> ***"Each beneficiary must ensure open access (free of charge, online access for any user) to all peer-reviewed scientific publications relating to its results."***
>
> General Model Grant Agreement Art. 29.2

Article 29.2 of the General Model Grant Agreement (MGA) for Horizon 2020 contains a **contractual obligation to OA**. Under Horizon 2020, each beneficiary must ensure open access to all peer-reviewed publications including the right to download(ing) and print(ing).

In addition, the Annotated Model Grant Agreement (AMGA) recommends beneficiaries to provide as many further rights as possible – such as the right to copy, distribute, search, link, crawl and mine – in order to increase the overall benefit of their publications. It is further encouraged to provide open access to other types of scientific publications, such as monographs, books, conference proceedings and "grey literature", in addition to the most frequent form of peer-reviewed publications, the journal article.

OA publishing involves two stages: first, the **publication will be stored in a repository**. Second, **open access** to the publication will be granted. In case of 'Green' open access, access can be granted after an embargo period. In accordance with article 29.2 MGA, the maximum embargo period may be up to six months or twelve months for publications in the field of social sciences and humanities. Moreover, also standardised bibliographic metadata have to be published in the repository. Metadata include information on the project and funding under Horizon 2020 such as title, acronym and grant number. Where possible, research data that can be used for the validation of the presented research results should also be published.

The European Commission recommends authors to retain their **copyright** and grant adequate licenses to publishers. To this end, the non-profit organisation Creative Commons offers useful licensing solutions.

To identify **appropriate repositories**, the European Commission recommends the EU-funded Open Access Infrastructure for Research in Europe (**OpenAIRE**) as well as the Registry of Open Access Repositories (**ROAR**) and the Directory of Open Access Repositories (**OpenDOAR**).

The OA requirements in Horizon 2020 also affect the project implementation of the **European Research Council (ERC)**. Its governing body, the ERC Scientific Council, recommends in its OA guidelines the use of subject-specific repositories such as Europe PubMed Central in the field of life sciences or arXiv in the field of physics and engineering. In case of a lack of an appropriate subject-specific

repository, Zenodo or OAPEN Library (for longer publications like book chapters or monographs) are recommended.

2.2 Open Research Data Pilot

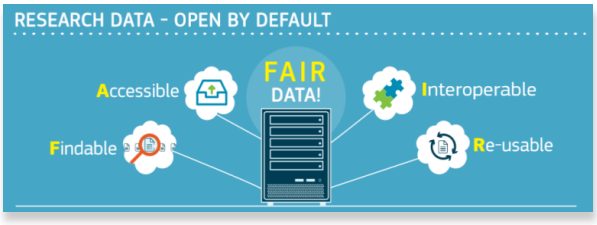

Figure 2: "FAIR Data" in the context of the Open Research Data Pilot (Source: European Commission 2016)

In the context of its OA policy, the European Commission aims to improve the access to research data generated by projects funded under Horizon 2020. Beneficiaries should make their research data **findable, accessible, interoperable and re-usable** (**FAIR**, see Figure 2[2]). Hence, the Open Research Data Pilot (ORD pilot) has been introduced as a flexible pilot action in Horizon 2020.

As a first step, only certain areas of the framework programme were included in the pilot. **Since July 2016, the ORD pilot has been extended to cover all the thematic areas of Horizon 2020.** Some funding lines are exempt from the ORD Pilot, for instance ERC Proof-of-Concept (PoC), the SME Instrument and Horizon 2020 Prizes. In practise, this means that Article 29.3 MGA regulating the participation in the ORD Pilot is included by default in all newly concluded Grant Agreements.

However, projects can withdraw from participation in the Pilot by **"opting-out"**. This may be the case if the protection of intellectual property, the commercial exploitation of results, ethical or safety-related obligations are a priority or if the project objective would be jeopardised. It is possible to opt out at any time, within the proposal stage, the preparation of the Grant Agreement as well as during the course of the project. With regard to the ERC, no reasons need to be given for opting out. Projects of all areas, so far not covered by the scope of the Pilot, may participate on a voluntary basis ("**opt in"**). The participation in the ORD Pilot is not part of the project evaluation, which means that proposals are not disadvantaged in case of opting out.

The obligation of OA publishing within the ORD Pilot refers to **data, including associated metadata, needed to validate the results presented in scientific publications**. Additionally, data are included that have been specified by beneficiaries and have been laid down in an individual Data Management Plan (DMP).

The OA publication of research data is conducted in three steps:

1. Storing of digital data in a (data) repository (an Overview of existing repositories is for instance given by Re3data and Databib)

[2] see https://ec.europa.eu/research/press/2016/pdf/opendata-infographic_072016.pdf

2. Ensuring open access by corresponding measures (access, mining, exploitation, reproduction, dissemination)
3. Provision of information on tools (e.g. software, algorithms, analysis protocols, etc.) which are needed to validate the research results

The implementation of the ORD Pilot's obligations brings (partly new) challenges regarding data management. In order to ensure the quality of the data management, projects participating in the ORD Pilot have to prepare a **Data Management Plan (DMP)**.

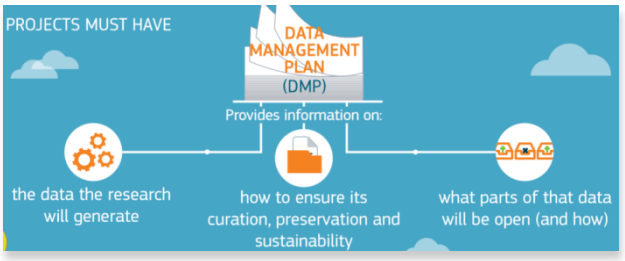

Figure 3: Content overwiev of a DMP (Source: European Commission 2016)

Figure 3[3] gives a general overview of the contents of a DMP. This overview refers to the entire project cycle and should document which data will be generated, which methodology and standards will be applied and whether data will be shared. A first version of the DMP should be prepared in Horizon 2020 projects within six month after the project start. It needs to be constantly updated in the course of the project. Regardless of the participation in the ORD Pilot, applicants in Horizon 2020 should consider the fact that data management is a relevant part of the chapter "Impact" of the proposal and should therefore not be neglected.

The European Commission provides "**Guidelines on FAIR Data Management**" as an orientation for participants in Horizon 2020, which includes a DMP template. Further references for the creation of a DMP (e.g. an online tool of the Digital Curation Centre) are listed in the link collection (see Chapter 4).

2.3 Costs for Open Access and their eligibility

The transition from publication of research results financed by journal subscriptions to OA publishing brings a financial restructuring. As a result, publication costs are no longer borne by end users but rather by the authors themselves. The costs, often called Article Processing Charges (APCs) or Book Processing Charges (BPCs), may vary widely. In many cases, these costs can be reimbursed by the higher education institution, the research institute or within the respective research funding programme. Some universities and research institutes (such as Helmholtz Association of German Research Centres, Max Planck Society, Technical University of Berlin, etc.) are increasingly investing in in-house publishing services. Several research funding organisations, such as the German Research Foundation (DFG), the Research Councils United Kingdom (RCUK) or the Austrian Science Fund (FWF), provide own OA funding programmes.

[3] see https://ec.europa.eu/research/press/2016/pdf/opendata-infographic_072016.pdf

In Horizon 2020 projects, **costs for OA** are **eligible as direct costs** if they arise directly from specific actions within the duration of the project. These include i.a. publication costs (e.g. 'gold' open access) or (personnel) costs for data curation or data storage and costs for the preparation of a DMP. Hence, relevant costs should already be taken into account in the budget plan during the proposal preparation.

3 Open Access in Germany & worldwide

At EU level, many institutions commit to the expansion and further development of OA. In May 2016, the Competitive Council stated that OA should become the publication standard for scientific publications until 2020.

However, the implementation requires rethinking and restructuring of systems from all involved actors (researchers, scientific institutions, publishers, research funding organisations, etc.). Open questions remain with regard to guidelines for repositories, reasonable embargo periods, Open Licences and financial arrangements for the publication costs. Nevertheless, not only the EU is dealing with these challenges, but there are rather many initiatives on OA in many countries of the world.

3.1 Current situation in Germany

The **Federal Ministry of Education and Research** (BMBF) presented its strategy on **"Open Access in Germany"** in September 2016. This strategy defines the framework conditions and development of initiatives fostering OA at Federal State level by providing incentives for higher education institutions. For the purpose of strengthening 'green' open access, amendments made to copyright law provide the initial legislative basis for OA. As a consequence, the indispensable right to secondary publication is guaranteed for the authors of scientific articles. This allows the subsequent publication of research results (self-archiving, institutional repositories), funded from public resources, for non-commercial purposes. The BMBF provides lump sums for projects and thus allows to cover project associated publication costs beyond the completion of the project. Moreover, a post-grant fund will be available in future.

The **DFG** maintains a funding programme to develop publication funds at higher education institutions. This funding programme should support the publication of research results in OA journals. Therefore, the financing of OA publications can be ensured by simple means. Furthermore, higher education institutions have the opportunity to raise funding for publications, which can be employed to finance OA journals.

3.2 Examples from other countries

Meanwhile, there are initiatives and policies concerning OA in many industrial states such as the United States, Canada, Australia or Japan. In the **United States**, the administration of the former president Barack Obama has defined OA

as a general method in the context of research funding. Particularly noteworthy are the **National Institutes of Health (NIH)** which have initiated PubMed Central (PMC), one of the most widely used repositories in the field of life sciences.

Especially 'green' open access is more and more widespread i.a.in Latin America. Examples include the Scientific Electronic Library Online (SciELO) from Brasil or LA Referencia, a network of OA repositories from nine Latin American countries cooperating with OpenAIRE.

Furthermore, major non-governmental organisations working in the field of research funding, like the Wellcome Trust and the Gates Foundation, pursue OA policies.

4 Useful links

4.1 Information & regulations on Open Access in Horizon 2020

- **Open innovation, open science, open to the world – a vision for Europe**: Publication on the political agenda of the European Commission https://ec.europa.eu/digital-single-market/en/news/open-innovation-open-science-open-world-vision-europe

- **KoWi Fact Sheet on Open Science:** http://www.kowi.de/Portaldata/2/Resources/fp/Factsheet_Open_Science.pdf (PDF)

- **Horizon 2020 Annotated Model Grant Agreement (AMGA):** annotated version of the Model Grant Agreement (MGA) containing all Open Access basic rules for projects funded under Horizon 2020 as well as further explanations, examples, "best practices", etc. http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf (PDF)

- **Fact Sheet Open Access in Horizon 2020:** https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/FactSheet_Open_Access.pdf (PDF)

- **Infographic Open Research Data in Horizon 2020:** https://ec.europa.eu/research/press/2016/pdf/opendata-infographic_072016.pdf (PDF)

- **Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020:** Explanations on the Horizon 2020 rules for Open Access http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf (PDF)

- **Guidelines on FAIR Data Management in Horizon 2020:** Explanations of data management including a template for Data Management Plans http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf (PDF)

- **Open Access Guidelines for research results funded by the ERC:** Specific guidelines and explanations on Open Access with regard to the ERC https://erc.europa.eu/sites/default/files/document/file/ERC_Open_Access_Guidelines-revised_feb_2016.pdf (PDF) or https://erc.europa.eu/sites/default/files/document/file/ERC_Guidelines_Implementation_Open_Access.pdf (PDF)

- **Horizon 2020 Frequently Asked Questions (FAQ):** a precise keyword search for "open access" and "open data" is possible https://ec.europa.eu/research/participants/portal/desktop/en/support/faq.html

4.2 Advice and assistance

- **European Liaison Office of the German Research Organisations (KoWi):** Information, consulting and training on all areas of the Research and Innovation Framework Programme of the European Union in flexible formats http://www.kowi.de/kowi/antrag-projekt/vertragsmanagement/regeln-geistiges-eigentum/open-access/open-access.aspx

- **Open Access Infrastructure for Research in Europe (OpenAIRE):** EU funded project offering support for the implementation of Open Access, publication databases, helpdesk, factsheets, webinars on data management, etc. https://www.openaire.eu/; https://www.openaire.eu/open-research-data-the-new-norm-in-h2020 (webinar on data management); https://www.openaire.eu/77-anja-oberlaender (National Open Access Desk for Germany)

- **Digital Curation Centre:** Information and implementation assistance for DMPs, inter alia an online tool for the creation of a DMP compatible with Horizon 2020 http://www.dcc.ac.uk/resources/data-management-plans or https://dmponline.dcc.ac.uk/

- **Information platform Open Access:** German platform providing background information, actual developments and practical

implementation assistance
http://open-access.net/startseite/

- **Helmholtz Association:** webinars and workshops on Open Science
  http://os.helmholtz.de/bewusstsein-schaerfen/workshops/;
  http://os.helmholtz.de/open-science-in-der-helmholtz-gemeinschaft/

- **GESIS Leibniz Institute for the Social Sciences:** specialised in Open Access in social sciences
  http://www.gesis.org/home/; http://www.gesis.org/unser-angebot/publikationen/open-access-policy/

4.3 Open Access repositories (selection)

- **OpenAIRE:**
  https://www.openaire.eu/

- **Open Access Policy of the U.S. National Institutes of Health (NIH):**
  https://publicaccess.nih.gov/

- **Registry of Open Access Repositories (ROAR):**
  http://roar.eprints.org/

- **Directory of Open Access Repositories (OpenDOAR):**
  http://www.opendoar.org/

- **Zenodo:** repository developed by OpenAIRE and CERN
  https://zenodo.org/

- **Europe PubMed:** repository in the field of life sciences recommended by the ERC
  https://europepmc.org/

- **arXiv:** repository in the fields of physics and engineering recommended by the ERC
  https://arxiv.org/

- **OAPEN Library:** repository for longer publications (e.g. book chapters, monographs, etc.) recommended by the ERC
  http://www.oapen.org/home

4.4 Open Access in different countries

- **Open Access strategy of the BMBF:**
  https://www.bmbf.de/pub/Open_Access_in_Deutschland.pdf (PDF)

- **Open Access on the website of the DFG:** http://www.dfg.de/foerderung/programme/infrastruktur/lis/open_access/index.html

- **Open Access Policy of the U.S. National Institutes of Health (NIH):** https://publicaccess.nih.gov/

- **LA Referencia:** Latin American network of Open Access repositories http://www.lareferencia.info/joomla/

- **Open Access at the Wellcome Trust:** https://wellcome.ac.uk/funding/managing-grant/open-access

- **Open Access Policy of the Gates Foundation:** http://www.gatesfoundation.org/en/How-We-Work/General-Information/Open-Access-Policy