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NATIONAL STRATEGY OF OPEN ACCESS TO SCIENTIFIC PUBLICATIONS AND RESEARCH DATA IN SLOVENIA 2015–2020



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1 FORMATION OF THE NATIONAL STRATEGY FOR OPEN ACCESS TO SCIENTIFIC INFORMATION

Scientific communication underwent no significant changes in the period prior to the beginning of the 21st century. In articles, which are evaluated by peers (i.e., other scholars), authors report about the research results that are mostly funded by public means. On the acceptance of article for publication they transfer their material copyright to the publisher that enables access to the research results after the payment of journal subscription and limits the use of figures, graphs and other parts of article in later publications with its permission. The majority of researchers is employed by public organisations which have to enable access to the latest achievements in science to their researchers through the payment of journal subscriptions. Research data is only selectively accessible in the traditional system of scientific communication.

The European Commission has started with the first activities towards the modernisation of scientific communication in 2004.¹ It has set out mandatory open access to all peer-reviewed publications from co-funded projects in the Horizon 2020 Framework Programme for Research and Innovation, which is being carried out in the period from 2014 till 2020. In 2014 and 2015, the Commission is implementing the open research data pilot. According to the European Commission recommendations the EU Member States should enforce the same mandates for national research funding. In such a way, open access to the results of publicly funded research will be ensured in the whole European Research Area and further development of open science enabled.²

Slovenia accedes to the adoption of open access mandates for scientific information, aligned with the recommendations of the European Commission, with the present strategy. In doing so, also the documents adopted by several EU Member States in accordance with the European Commission recommendations are helpful: Spain³ (the law), Belgium,⁴ Ireland,⁵ Portugal⁶ (national policies), Denmark,⁷ Sweden,⁸ Austria⁹ and Norway¹⁰ (funder mandates). In MedOANet project, funded through the Seventh Framework Programme, the recommendations were prepared for the formation of open access policies.¹¹ Through the Seventh Framework Programme, the European Commission has also funded the RECODE project for the formation of policy recommendations for open access to research data in

¹ Open Access Slovenia: mednarodna raven: pregled aktivnosti Evropske Unije, <http://www.openaccess.si/mednarodna-raven/pregled-aktivnosti-evropske-unije/>

² Consultation on »Science 2.0«: science in transition, https://ec.europa.eu/research/consultations/science-2.0/consultation_en.htm

³ Recommendations for the implementation of Article 37 of the Spanish Science, Technology and Innovation Act: Open Access Dissemination,

http://recolecta.fecyt.es/sites/default/files/contenido/documentos/Implantacion_Art37_AccesoAbierto_INGLES.pdf

⁴ Brussels declaration on open access to Belgian publicly funded research,

<https://openaccessbelgium.files.wordpress.com/2012/10/brussels-declaration-on-open-access.pdf>

⁵ Ireland: the transition to open access, <http://www.pasteur4oa.eu/sites/pasteur4oa/files/resource/Ireland%20Case%20Study.pdf>

⁶ Portugal open access policy landscape,

<http://www.pasteur4oa.eu/sites/pasteur4oa/files/resource/Portugal%20Case%20Study.pdf>

⁷ Denmark's national strategy for Open Access, <http://ufm.dk/en/research-and-innovation/cooperation-between-research-and-innovation/open-science/open-access-to-research-publications/engelsk-version-national-strategy-for-open-access.pdf>

⁸ Proposal for national guidelines for open access to scientific information, <https://publikationer.vr.se/en/product/proposal-for-national-guidelines-for-open-access-to-scientific-information/>

⁹ New Policy for Open Access and Publication Costs, <http://www.fwf.ac.at/en/news-and-media-relations/news/detail/nid/20141219-2097/>

¹⁰ Education, research and open access in Norway,

http://www.pasteur4oa.eu/sites/pasteur4oa/files/resource/Norway%20Case%20Study_0.pdf

¹¹ MedOANet guidelines for implementing open access policies: for research performing and research funding organizations, http://medoanet.eu/sites/www.medoanet.eu/files/documents/MED2013_GUIDELINE_dp_EN_ws.pdf

Europe.¹² It is still funding the PASTEUR4OA project for the alignment of open access policies in EU Member States with the open access mandate in Horizon 2020 programme.¹³

The present document *National strategy of open access to scientific publications and research data in Slovenia 2015–2020* determines that each beneficiary has to ensure open access to all peer-reviewed scientific publications that refer to the results from the nationally funded research in the period from 2015 until 2020. Before the adoption of the open research data mandate a national pilot programme *Open access to research data* will be carried out.

The strategy also determines that journals published by the publishers based in Slovenia, containing peer-reviewed articles and receiving national public funding for their activities in the period from 2015 until 2020, have to be openly accessible. Research data, discussed in articles, have to be available in open access. Publishers of scientific monographs, based in Slovenia, which receive national public funding in the period from 2015 until 2020, should strive to publish the monographs through business models that will enable open access to their full text immediately upon publication and their licensing with open access licenses.

The subscription and copyright limitations for access to and for the re-use of scientific information, generated with the national public funding, will be suppressed with the implementation of open access in Slovenia. We wish that the recommendations of the Budapest Open Access Initiative and the Hague Declaration on Knowledge Discovery in the Digital Age are implemented:¹⁴

- Open access benefits research and researchers, and the lack of open access impedes them.
- Open access for publicly-funded research benefits taxpayers and increases the return on the investment, it has economic benefits as well as academic or scholarly benefits.
- Open access amplifies the social value of research, and open access policies amplify the social value of funding agencies and research organisations.
- The costs of open access can be recovered without adding more money to the current system of scholarly communication.
- Open access is consistent with copyright law everywhere in the world, and gives both authors and readers more rights than they have under conventional publishing agreements.
- Ethical norms in research as well as the further development of legislation, infrastructure and standards have to support as well as encourage content mining for the benefit of the whole society.

¹² Policy Recommendations for Open Access to Research Data in Europe (RECODE), <http://recodeproject.eu/>

¹³ Open Access Policy Alignment Strategies for European Union Research (PASTEUR4OA), <http://www.pasteur4oa.eu/>

¹⁴ Ten years on from the Budapest Open Access Initiative: setting the default to open, <http://www.budapestopenaccessinitiative.org/boai-10-recommendations>, The Hague Declaration on Knowledge Discovery in the Digital Age, <http://thehaguedeclaration.com/the-hague-declaration-on-knowledge-discovery-in-the-digital-age/>

2 OPEN ACCESS TO SCIENTIFIC PUBLICATIONS AND RESEARCH DATA

In this chapter, the explanations regarding open access to scientific information are provided that are used for beneficiaries in programmes and projects, funded or co-funded by the Republic of Slovenia. In the continuation of the strategy, the term »funding« is used for any share of co-funding with the national public funding.

2.1 Definition of open access to scientific publications and research data

In this strategy, the phrase »scientific information« refers to peer-reviewed scientific research articles (published in scientific journals), to peer-reviewed scientific monographs and to research data which is prepared for the re-use (data underlying publications, as well as raw data, ready for the analysis, that has undergone the curation, even if it is not directly connected with publications).

Open access is defined as web access to scientific information¹⁵ that is free of charge to the end-user and enables the re-use of scientific information. The two forms of open access to scientific information are open access to scientific publications and open access to research data.

2.1.1 Open access to scientific publications

Open access to scientific publications encompasses gratis access to the full text of publications in a repository on the world wide web or to the full text on the publisher's website and licensing the content with open access licenses. The repository has to enable free access, unlimited dissemination, interoperability and preservation. Open access licenses enable various re-use (besides reading, download and printing also copying, usage, distribution, transmission and public display, the making and distribution of derivative works in any digital medium for any responsible purpose).¹⁶

The two main modes of open access to scientific articles are:

- **Self-archiving in a repository** (also referred to as green open access), where the author or his representative archive (deposit) the published article or the final peer-reviewed manuscript in an online repository, respecting the copyright, before, alongside or after its publication. Repository software allows the author to delay access to the full text of the appropriate version of the article (»embargo period«) because of the publishers' requirements as holders of material copyright.
- **Publication of an article in an open access journal** (also referred to as gold open access) enables that an article is openly accessible immediately upon publication, the copyright is managed with open access licenses (the authors retain the material copyright, the published article can be archived in the repository). The eventual cost of publishing an open access article (i.e., Article Processing Charges, APC) is paid by the author, the reader has no costs. The finances for paying the Article Processing Charges can be ensured by the research organisation to which the researcher is

¹⁵ The term »scientific« refers to all scholarly disciplines.

¹⁶ Open Access Slovenia: definicije in deklaracije, <http://www.openaccess.si/definicije-in-deklaracije/>

affiliated, by the research funder or by another organisation. Within its business model also the publisher can ensure the finances needed.

With the payment of Article Processing Charges, openness of scientific articles can also be ensured in hybrid journals. These are subscription journals which establish open access to the article full text after the payment of Article Processing Charges, authors retain the material copyright through the licensing with open access licenses, e. g., Creative Commons, and grant the rights to third parties according to the features of a chosen license.

Various business models were developed for open access for scientific monographs.¹⁷

2.1.2 Open access to research data

Research data, created with public funding, have to be as open as possible and accessible with as little limitations as possible. Open research data has to be discoverable, accessible, assessable, intelligible, useable, and, wherever possible, interoperable to specific quality standards.¹⁸ Open access to research data refers to the right of web access and re-use of digital research data¹⁹ under the conditions, set in the grant agreement. Access, mining, exploitation, reproduction and dissemination are free of charge.

Exemptions from the default fully open access have to be exactly defined and founded, e.g., because of the national security, the protection of personal data and the intellectual property rights of private co-funders. Legal and ethical aspects for open access have to be verified. If access to research data is limited because of the legitimate exemptions, then at least openly accessible metadata have to be prepared for the catalogue of a thematic data centre that specify where and under which conditions the research data is available.

2.2 Decision regarding publication of results or protection of intellectual property rights

The results of publicly funded research may be published in scientific journals, monographs or digital archives, they may also be protected with the intellectual property rights because of the possibility for commercial exploitation (patents ...). Open access to the results of publicly funded research is, as a rule, required when the results of publicly funded research are published in scientific articles, monographs and digital archives. Open access mandate should not interfere with the researcher's decision regarding the choice of the most suitable journal for the publication of the research results or their commercial exploitation, e.g., through patenting.²⁰

As a rule, open access to the publication has to be ensured when the decision is reached for the dissemination (publication) of the results of publicly funded research, as is shown in the

¹⁷ Open Access Slovenia: načini objavljanja: odprte monografije, <http://www.openaccess.si/nacini-objavljanja/odprte-monografije/>

¹⁸ G8 Science Ministers Statement, <https://www.gov.uk/government/news/g8-science-ministers-statement>

¹⁹ According to the OECD Principles and Guidelines, the research data generally is the digitally readable factual records which represent the basis for scientific research and are commonly accepted by the scientific community as necessary to validate research findings. See Štebe, J., Bezjak, S., Lužar, S. *Akcijski načrt za vzpostavitev sistema odprtega dostopa do raziskovalnih podatkov, financiranih z javnimi sredstvi: predlog*. Ljubljana: Arhiv družboslovnih podatkov, 2013, p. 5. <http://www.adp.fdv.uni-lj.si/media/publikacije/AkcijskiNactODPP10.pdf>

²⁰ European IPR Helpdesk: Publishing vs. Patenting, <https://www.iprhelpdesk.eu/node/1950>

chart of open access to the scientific publications and research data in the wider context of dissemination and exploitation of research results.²¹

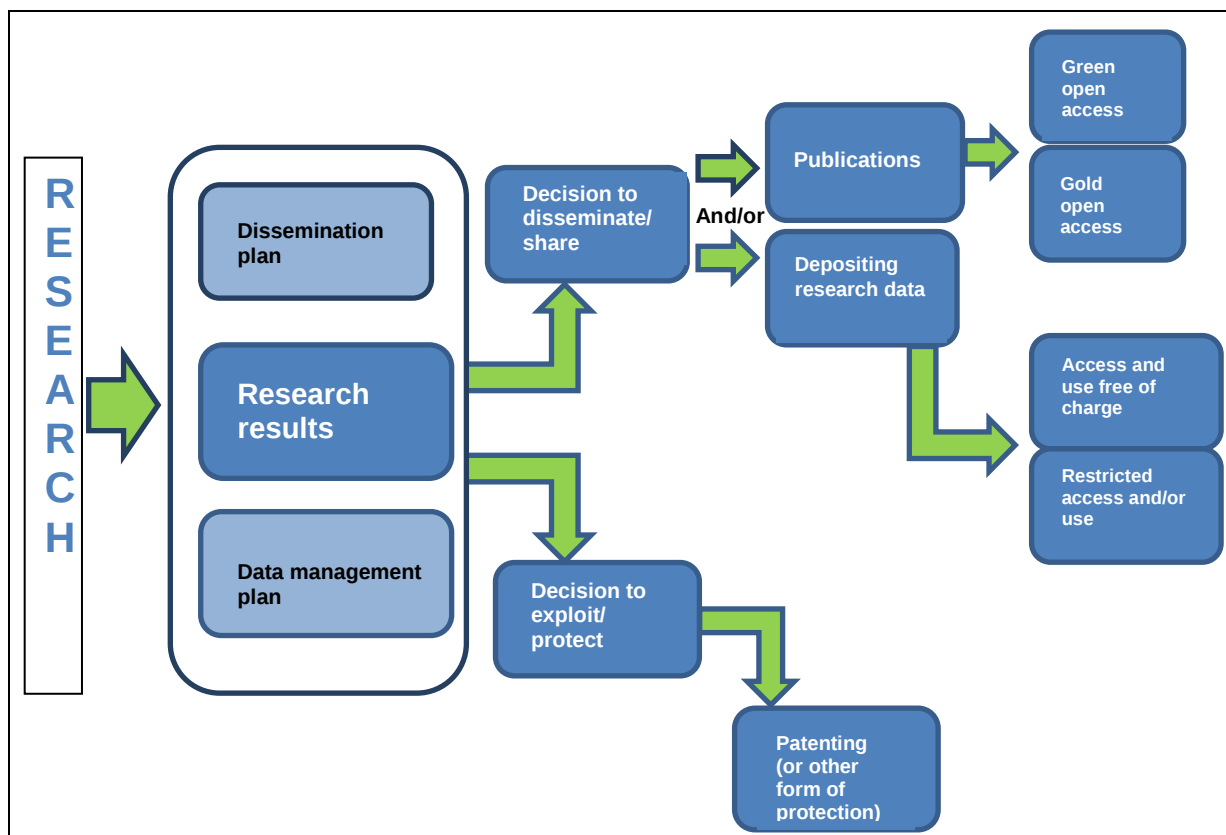


Fig. 1: Decision chart regarding dissemination or exploitation of results of the publicly funded research

2.3 Challenges of open access to scientific information

European researchers are mostly active within the European Research Area, they carry out research with the funding of the European Commission and the national research funders. The national policy of an EU Member State has to be aligned with the policy and mandate for open access in Horizon 2020 programme. Non-alignment means the weakening of the European Research Area and smaller visibility and impact of nationally funded research.

The research funder has to monitor compliance with the open access mandate for scientific information, check the reasons for low compliance and encourage the removal of obstacles.

Repositories and national open access infrastructures for scientific information have to be suitably and sustainably designed and interoperable with international infrastructures. Unsuitable design of repositories for scientific publications and research data will disable the funders to harvest metadata for monitoring the compliance with open access mandate for scientific information, sustainability will not be ensured.

²¹ Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020, http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf

In green open access, the lack of knowledge on copyright issues can cause the researchers to deposit the published articles and not peer-reviewed preprints in the repositories. The same mistake can be made on enabling public access to articles via the website, where the additional problematic issue is that funders will not harvest the metadata of the publication on the website during the monitoring of compliance. Open access licenses, e. g., Creative Commons, enable various re-uses of scientific information, for example the making and distribution of derivative works, but the science ethics framework still has to be observed. Programmes' and projects' coordinators do not take care of the compliance with open access mandate in grant agreements, depending on the funder mandate, the research funding can be reduced.

Publishers of scientific journals allow the periods of temporary unavailability of peer-reviewed preprints in repositories that are longer than the embargoes required by research funders (e.g., the latter require access to the article full text in six months at the latest and the publishers allow access to the peer-review preprint only after twelve months).

Article Processing Charges (APC) were spotted as a business opportunity and the possibility for quick profit with open journals publishing. The consequences or the side effects of new business models for academic publishing are also predatory publishers and journals, the providers of misleading metrics as well as »stolen« journals.²²

Article Processing Charges are generally the highest at commercial academic publishers and in hybrid journals.²³ The latter are subscription journals where some authors have paid for the openness of their articles, yet the journal subscribers have not noticed the decrease of subscriptions to hybrid journals (i.e., double dipping), in spite of the fact that the publishers guarantee relevant setting off of paid Article Processing Charges during subscriptions calculations.

²² Beall's List: Potential, possible, or probable predatory scholarly open-access publishers, <http://scholarlyoa.com/publishers/>, Plenilski založniki, <http://vodici.fdv.uni-lj.si/subjects/guide.php?subject=OAR#tabs-5>

²³ A study of open access journals using Article Processing Charges, <http://www.openaccesspublishing.org/apc2/>

3 VISION AND GOALS OF OPEN ACCESS TO PEER-REVIEWED PUBLICATIONS AND RESEARCH DATA IN SLOVENIA

The vision of the Republic of Slovenia is open access to scientific information from publicly funded research (in the form of scientific publications and research data) and their exemption from the system of payment for access and re-use. Openly accessible scientific information should benefit Slovenian citizens, researchers and economy. Web access has to be enabled to all available scientific information without cost for the users and the preservation of scientific information ensured.

Modern research builds on extensive scientific dialogue and achievements of previous research. The *Europe 2020*²⁴ strategy for smart, sustainable and inclusive economy underlines the central role of knowledge and innovation in generating growth. Open access to scientific publications and research data enables:

- more efficient use and upgrade of the results of previous research (higher quality of research),
- collaboration and avoidance of research duplication (greater efficiency),
- acceleration of innovation (faster transfer to market causing faster growth),
- involvement of citizens and society (improved transparency of science).

The Republic of Slovenia therefore strives to improve access to scientific information in the form of scientific publications and research data and their openness with which the country also wants to achieve greater efficiency of public research funding. As a rule, the results of all publicly funded scientific research in the Republic of Slovenia have to be completely openly accessible.

Goals:

- 80 percent of scientific publications from nationally funded research, published in 2017, will be openly accessible in 2018,
- all scientific publications from nationally funded research (100 percent), published in 2020, will be openly accessible in 2021,
- the realization of the pilot programme *Open Access to Research Data* in the period 2017–2020,
- analysis of the pilot programme results,
- the formation of open research data policy and provision of conditions for its realization in the next period (after the year 2020), based on the experiences of *Open Research Data Pilot* in Horizon 2020 and the pilot programme *Open Access to Research Data*.

²⁴ Europe 2020: a strategy for smart, sustainable and inclusive growth, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

4 PRINCIPLES OF OPEN ACCESS TO SCIENTIFIC PUBLICATIONS AND RESEARCH DATA IN SLOVENIA

4.1 Open access to scientific information is in the interest of the society

The individuals and the society use scientific information in the form of scientific publications and research data in all areas of social and private life. With open access to scientific information, the Slovenian knowledge, innovation and skills will be globally available to users (researchers, public at large, research partners, and consumers), which will improve the quality of life and increase the recognisability, reputation and impact of Slovenian scientific research enterprise and enable its fuller integration into global development.

4.2 Open access to scientific information is in the interest of the economy

The economy has to be acquainted with open accessibility of results from publicly funded research in Slovenia and in Europe in order to use them for the development of new products and services. Openly accessible scientific information from the research, funded with national and European public means, is available at the Open Science Slovenia portal²⁵ and at the OpenAIRE portal.²⁶

4.3 Open access to scientific information is part of open science

Slovenia supports the principles of open science which are the transparency of the experiment methodology, observation and data collection, public availability and the re-use of research data, public availability and transparency of scientific communication and the use of web tools to support the scientific collaboration.²⁷ The open science is carried out in a way that enables the researchers to cooperate in different phases of the research process with all types of openly accessible data, results and protocols.²⁸ Open accessibility of scientific information in the form of peer-reviewed publications and research data is an important part of open science.²⁹

4.4 Scientific information is national scientific heritage

Scientific information in the form of scientific publications and research data represents the national scientific heritage, irregardless of its originality and size. The national scientific heritage encompasses publications of Slovenian scientists in Slovenian and international scientific journals, scientific journals published by publishers based in Slovenia, and scientific monographs of Slovenian scientists, published by international publishers as well as in Slovenia. Part of scientific information is available via publications and digital archives, the other part is not published because of special requirements, needs or limitations and is accessible through other channels. Both parts represent the national scientific heritage and, as a rule, have to be openly accessible with respect of intellectual property rights.

²⁵ Nacionalni portal odprte znanosti: dostop do znanja slovenskih raziskovalnih organizacij, <http://www.openscience.si/>

²⁶ Open Access Infrastructure for Research in Europe (OpenAIRE), <https://www.openaire.eu/>

²⁷ What, exactly, is Open Science? <http://www.openscience.org/blog/?p=269>

²⁸ Open to all? Case studies of openness in research, <http://www.rin.ac.uk/our-work/data-management-and-curation/open-science-case-studies>

²⁹ Open Science, <https://ec.europa.eu/digital-agenda/en/open-science>

The collection, preservation and open access to all scientific information generated on the territory of Slovenia as well as to all scientific information referring to Slovenia is especially important.

4.5 Licensing scientific information with open access licenses enables the widest re-use of research results

The researchers should strive to license the scientific information according to the open access principles. On publication of peer-reviewed publications, they should strive to retain material copyright and, if this is not possible, they should obtain the permission for the publication through the institutional repository, according to the open access principles.

Public research organisations should, also with encouraging the use of open access licenses (e.g., Creative Commons), encourage licensing the scientific publications, and when necessary, the research data according to the open access principles so that copyright of authors and third parties will be respected and the widest possible open access and re-use of scientific publications and research data enabled.

4.6 Evaluation of science should encourage open access to scientific information

The evaluation of researchers, research organisations, research programmes and projects should encourage open accessibility of scientific information in the form of publications and research data. The criteria for the evaluation of science should also include relevant new methods for the evaluation of science.

4.7 Appropriate funding is necessary to ensure sustainability of the national infrastructure for open access to scientific information

The national open access infrastructure for scientific information in the form of publications and research data is composed of people, organisations, equipment (machines and software), and content. Sustainability of the national open access infrastructure can only be ensured through continuous public funding, which enables the use of international standards for the creation, publication, dissemination, use, processing, preservation and archiving of scientific information, the education of all stakeholders and the notification of the national and international public on the availability and the ways of using the services and information via the national open access infrastructure.

Openly accessible scientific information in the form of publications and research data has to be securely preserved to prevent loss, damage and misuse.

4.8 Slovenian open access infrastructure is part of international infrastructures for open access in science

The national open access infrastructure for peer-reviewed publications and research data has to be interoperable with relevant European and international infrastructures. Slovenian publications repositories, research data repositories and archives as well as software for scientific journal publishing have to be compatible with OpenAIRE guidelines, which will

enable the European and national research funders to monitor the compliance with open access mandates for scientific information.

5 POLITICAL AND LEGAL BASIS FOR MANDATES ON OPEN ACCESS TO SCIENTIFIC INFORMATION IN SLOVENIA

The basic documents at the European level are:

- The document *A digital agenda for Europe*³⁰ determines the open data policy, covering the full range of information that public organisations in the European Union generate, collect or finance.
- The document *Research and innovation as sources of renewed growth*³¹ defines the European policy and EU programmes for research and innovation.
- The communication from the European Commission *A reinforced European Research Area partnership for excellence and growth*³² determines the European Research Area (ERA) as a unified research area, open to the world, based on the internal market, in which researchers, scientific knowledge and technology circulate freely. One of the key priorities foreseen to achieve this goal is open access to scientific information.

The principles of these political documents are more precisely defined in the communication of the European Commission *Towards better access to scientific information: Boosting the benefits of public investments in research*³³ and in the *Commission Recommendation of 17. 7. 2012 on access to and preservation of scientific information*.³⁴ In the communication, the European Commission mandate regarding open access in the Horizon 2020 EU Framework Programme for Research and Innovation is spelled out.³⁵ The recommendation entrusts the EU Member States to establish the national open access policies on the basis of the principles that are valid for Horizon 2020 framework programme.

The relevant documents at the national level are:

- *The resolution on the national research and development programme 2011–2020*³⁶ states the »open access to raw data from research, funded by public means« as one of the goals, and the preparation of action plan till 2014 as the basis for the national policy for open access to data from publicly funded research.

³⁰ A Digital Agenda for Europe, [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0245R\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0245R(01)&from=EN)

³¹ Research and innovation as sources of renewed growth, <http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/research-and-innovation-as-sources-of-renewed-growth-com-2014-339-final.pdf>

³² A Reinforced European Research Area Partnership for Excellence and Growth, http://ec.europa.eu/euraxess/pdf/research_policies/era-communication_en.pdf

³³ Towards better access to scientific information: Boosting the benefits of public investments in research, http://ec.europa.eu/research/science-society/document_library/pdf_06/era-communication-towards-better-access-to-scientific-information_en.pdf

³⁴ Commission Recommendation of 17. 7. 2012 on access to and preservation of scientific information, http://ec.europa.eu/research/science-society/document_library/pdf_06/recommendation-access-and-preservation-scientific-information_en.pdf

³⁵ Documents on open access in the Horizon 2020 EU Framework Programme for Research and Innovation: Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020, http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf, Guidelines on Data Management in Horizon 2020, http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf, General Multi-

beneficiary Model Grant Agreement for Horizon 2020 Programme, September 2014: Article 29 – Dissemination of Results – Open Access – Visibility of EU Funding, http://ec.europa.eu/research/participants/data/ref/h2020/mga/gga/h2020-mga-gga-multi_en.pdf

³⁶ The Resolution on the National Research and Development Programme 2011–2020, http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi_z_javnostmi/01.06.2011_dalje/01.06_RISSdz_ENG.pdf

- *Research infrastructures roadmap 2011–2020*,³⁷ in which the gratis and libre open access to publications and research data is included in priority international projects and national topics.³⁸

³⁷ Research Infrastructures Roadmap 2011–2020,
<http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/znanost/RISS/SIR.pdf>

³⁸ Gratis and libre open access to publications and research data is included into chapters *Priority international projects* (cooperation in ESS, DARIAH and CESSDA) and *Priority national topics* (National digital resources, Research infrastructure for the social sciences and the humanities).

6 MANDATE FOR OPEN ACCESS TO PEER-REVIEWED PUBLICATIONS IN SLOVENIA

In the framework of nationally funded research and according to the valid rules, adopted on the basis of implementing documents, each beneficiary has to ensure open access to all peer-reviewed articles relating to the research results.

Peer-reviewed publications refer to publications that have been evaluated by peers, i.e., other scholars. The latter review the manuscript sent to them by the publisher of a journal or a monograph.

The dominant type of peer-reviewed scientific publications is the journal article. The funder strongly encourages the beneficiaries to provide open access also to other types of scientific publications, some of which may not be peer-reviewed (scientific monographs, books, lectures published in proceedings, grey literature – reports ...).

Beneficiaries must ensure that the full texts of all peer-reviewed publications, referring to the research results, can be read online in a repository, downloaded and printed. The beneficiaries should strive to their best abilities to license the publications with open access licenses (e.g., Creative Commons),³⁹ which will enable wider re-use of peer-reviewed publications (besides reading, downloading and printing also copying, usage, distribution, transmission and public display, the making and distribution of derivative works in any digital medium for any responsible purpose).

The open access mandate for peer-reviewed publications in Slovenia is composed of two steps, the first one is the deposit of a publication in a repository, and the second one the provision of open access to the full text of a publication via the repository. These two steps can be carried out simultaneously, depending on whether self-archiving of a relevant article version (green open access) is chosen, where the eventual embargo period influences access to the full text of the article via the repository, or the publication of an article in an open access journal (gold open access) or an open access article in a hybrid journal is done. Open access to peer-reviewed scientific monographs has to be ensured according to the two steps, respecting the copyright.

6.1 Deposit of publication in a repository

Beneficiaries have to deposit a machine-readable electronic copy of a final peer-reviewed manuscript of the article, accepted for publication, or the published article in a repository for scientific publications. This must be done as soon as possible and upon publication at the latest (in some cases, the deposit of the relevant version of an article is possible before publication, for example upon acceptance of the article by the journal). Copyright permitting, the published article has to be deposited (regarding layout, page numbering ...). The article

³⁹ Open access licenses Creative Commons are pre-prepared licenses that grant permitted use and define not permitted use of publications. Licensing of an author work with Creative Commons (CC) license does not mean that the author waives the author rights. The author retains the material copyright and permits the use of his/her publication to all under the permissions specified, with the purpose to ensure the widest possible re-use. The Creative Commons 4.0 International license is the same in all jurisdictions and is used for licensing publications, research datasets and databases (<http://creativecommons.org/licenses/by/4.0/>).

has to be deposited in a repository also when it is published in an open access journal (gold open access) or as an open access article in a hybrid journal.

The term »machine-readable electronic copy« means that the publications have to be in a format that can be used and understood by a computer. The publications have to be stored using text file formats which are either standardized or otherwise publicly known so that development of new tools for working with these documents is possible.

A repository for scientific publications is an online archive. Institutional, subject-based and centralised repositories are all acceptable choices. Beneficiaries should not choose a repository which claims rights over deposited publications and precludes access.⁴⁰

The beneficiaries must strive to deposit at the same time the research data needed to validate the results, presented in the deposited scientific publications. The most appropriate digital archive for this purpose is the relevant data repository. The concept of publication has rapidly evolved over the past years and in the context of the digital era, and increasingly includes the underlying research data. This data is needed to validate the results, presented in the deposited scientific publication, and therefore has to be considered as the crucial part of the publication, enabling scientific best practice.

6.2 Ensuring open access to publication via the repository

Beneficiaries have to ensure open access to the full text of the deposited publication and the underlying data via the chosen repository.

Time-wise, the ensuring of open access depends on the mode of open access:

- **Self-archiving in a repository (green open access):** the beneficiaries have to ensure open access to the full text of the publication in a form of a final peer-reviewed manuscript of the article in a repository within a maximum of six months from the date of publication (or in maximum twelve months for publications in the social sciences and humanities).
- **Open access journals (gold open access) or open access article in a hybrid journal:** full text of the publication has to be openly accessible in a repository in a form of the published article upon publication at the latest.
- **Open access scientific monographs,** licensed with open access licenses Creative Commons, have to be openly accessible in a repository in a form of a published monograph upon publication at the latest.

6.3 Metadata

On deposit of publication in a repository, the beneficiaries also have to ensure open access – via the repository – to the bibliographic metadata of the publication that has to be in a standard format. The authors of publications and the research datasets must have national identification attributes and have to be uniquely attributable through identifiers which are

⁴⁰ The Open Access Infrastructure for Research in Europe provides support for choosing the repository (OpenAIRE, <https://www.openaire.eu/>), the information on open access repositories is also available in OpenDOAR (<http://www.opendoar.org/>) and ROAR listings (<http://roar.eprints.org/>).

persistent, non-proprietary, open and interoperable (e.g., the use of existing sustainable initiatives such as ORCID⁴¹ for author identifiers and DataCite⁴² for research data identifiers).

Metadata also has to contain all the following data:

- the funder acronym,
- the programme of funding,
- the title of the project, acronym and grant agreement number,
- the publication date and length of embargo period, if applicable,
- persistent identifier.

The persistent identifier (for example a Digital Object Identifier, DOI, Universal Resource Name, URN) permanently identifies the individual publication and the location of its published version. If persistent identifier is recorded in the metadata of a peer-review preprint in a repository, linking is possible to its published version.

6.4 Article Processing Charges of an open access publication

Through the green open access, the researchers can comply with open access mandate for peer-reviewed publications from the publicly funded research with no additional costs. Should they decide for the paid open accessibility of a publication, the Article Processing Charges (APC) of an open access peer-reviewed article in an open access scientific journal and in a hybrid scientific journal as well as Book Processing Charges of an open access monograph are eligible costs for reimbursement during the period of the research. Article Processing Charges of articles in open access journals and of open access articles in hybrid journals as well as of open access monographs, incurred after the completion of the research, are not eligible for reimbursement from the research funding.

The organisations managing consortia for access to paid scientific information resources are obliged to provide the transparency of license agreements with publishers. While managing the consortia for access to paid scientific information resources, they should strive for more favourable Article Processing Charges of open access peer-reviewed articles for researchers from the Slovenian research organisations and try to their best abilities to prevent double payments to publishers of hybrid scientific journals (subscription for access to the journal as well as Article Processing Charges of openly accessible articles). At the same time they must also strive to achieve appropriate embargo periods.

Joint negotiations with publishers of open access journals regarding Article Processing Charges of open access articles should be carried out for the consortium of Slovenian research organisations to ensure economically most favourable publishing.

6.5 Support for researchers and monitoring of compliance

In cooperation with other stakeholders, the research organisations should establish the support for researchers regarding compliance with open access mandate for scientific

⁴¹ ORCID is alphanumeric code for unique identification of authors of scientific and other documents (<http://orcid.org/>).

⁴² DataCite is an international association the main purpose of which is to develop and support discovery, identification and citation of research data and other research objects (<https://www.datacite.org/about-datacite/what-do-we-do>).

information. In order to avoid duplication, the stakeholders should strive to cooperate in providing support services at the national level.

In the European Research Area, the European and national research funders will use the OpenAIRE portal services to monitor compliance with the open access mandates. Slovenian publications repositories, data centres as well as software for scientific journal publishing have to be compatible with OpenAIRE guidelines, which means that in the digital unit metadata the data on the funder, the programme of funding, the title of the project, the acronym, the grant agreement number, and the publication date as well as the length of embargo period, if applicable, will be provided.

The consequence of non-compliance with the open access mandate can result in imposing sanctions, appropriately and proportionally defined by implementing acts.

7 PILOT PROGRAMME OPEN ACCESS TO RESEARCH DATA IN SLOVENIA

To establish the necessary procedures and inform the researchers and the public at large, the national pilot programme *Open access to research data* will be carried out before the adoption of the open research data mandate. The pilot programme aims at concretisation of further development of the Slovenian open science policy and will strive to improve and maximize access to and re-use of research data.

Scientific areas where the openness principle is the easiest to realize because of the existing data infrastructure are included in the pilot programme as priority:

- social sciences,
- humanities,
- medicine,
- biological sciences.

The individual research action may opt out completely or partially from the pilot programme *Open access to research data* for a variety of reasons in any stage:

- if participation in the pilot programme is incompatible with obligation to protect all the results for which it can be reasonably expected that they will be commercially or industrially exploited,
- if participation in the pilot programme is incompatible with the need for confidentiality in connection with the national security issues,
- if participation in the pilot programme is incompatible with existing rules concerning the protection of personal data,
- if participation in the pilot programme would jeopardise the achievement of the main aim of the research,
- if the research will not generate / collect any research data,
- if there is other legitimate reason to not take part in the pilot programme.

The proposals will not be evaluated more favourably because they will take part in the pilot programme nor will they be less favourably evaluated because of opting out of the pilot programme.

During the lifetime of the research a programme or a project can opt out of the pilot programme *Open access to research data* for any of the reasons above, which have to be described in the data management plan.

Areas or subareas of, or individual projects, funded from the budget of the Republic of Slovenia, that are not covered by the scope of the pilot programme *Open access to research data* may participate in the pilot programme on a voluntary basis. Programme and project groups that decide to participate in the pilot programme on a voluntary basis will be monitored along with and receive the same support as projects participating in the pilot programme.

The pilot programme *Open access to research data* applies to two types of data:

1. The data, including associated metadata,⁴³ needed to validate the results presented in scientific publications. They have to be openly accessible as soon as possible.
2. Other data,⁴⁴ including associated metadata, as specified and within the deadlines laid down in the data management plan.

A data management plan is a document outlining which research data will be collected or generated during the research, how it will be handled, following what methodology and standards, where and how this data will be shared and/or made open, and how it will be curated and preserved for the appropriate length of time. For each collected or generated research data the explanation has to be provided on its openness, i.e., the open research data has to be discoverable and identifiable (the use of persistent identifiers), accessible (the use of open access licenses, reasonable embargo lengths), assessable and intelligible, it has to be suitable for re-use (securely stored and curated by the certified repositories), and attain specific quality standards.

Research that is part of the pilot programme *Open access to research data* must provide the first version of the data management plan till the sixth month inclusive of the action, covering individual datasets. Other funded research that does not participate in the pilot programme is also invited to submit a data management plan, if relevant for the planned research.

The grant agreements for funding of programmes and projects, participating in the pilot programme *Open access to research data*, include a special clause according to which the beneficiaries have to fulfil the following requirements:

- The aforementioned two types of research data have to be deposited, preferably in a research data repository. Research data repositories are online archives for research data. They can be subject-based/thematic, institutional or centralized. As a priority, the research data has to be deposited at the authorized national data centres from the list of the Slovenian Research Agency.
- Programmes and projects in the pilot programme must take measures to enable for third parties to access, mine, exploit, reproduce and disseminate the research data, free of charge to all users. Licensing with open access licenses Creative Commons (CC BY or CC0) is a straightforward and effective way to attain this goal.⁴⁵
- At the same time, the programmes and the projects have to provide information via the chosen repository about tools and instruments at disposal for the validation of results (i.e., specialized software or software code, analysis protocols etc.).

Costs relating to the implementation of the pilot programme *Open access to research data* will be eligible for reimbursement during the research action. Specific technical and professional support services will also be provided.

The research data that has undergone the scientific judgement and has been as such deposited at the authorised data centre is recognised as a scientific publication in the evaluation of the results of the programme or project.

⁴³ Associated metadata refers to the metadata describing the research data deposited.

⁴⁴ Regarding the content, the data is available in the raw, non-processed format, and includes the most non-analysed details (G8 Science Ministers Statement, <https://www.gov.uk/government/news/g8-science-ministers-statement>).

⁴⁵ Creative Commons: about the licenses, <http://creativecommons.org/licenses/>, Creative Commons: about CC0 – No Rights Reserved, <http://creativecommons.org/about/cc0>

8 OPEN ACCESS TO SCIENTIFIC JOURNALS AND MONOGRAPHS, PUBLISHED IN SLOVENIA

Journals published by publishers, based in Slovenia, incorporating peer-reviewed articles and receiving national public funding for their activities, have to be openly accessible (i.e., gold open access). Peer-reviewed articles from these journals have to be openly accessible immediately upon publication and licensed with open access licenses (e.g., Creative Commons). Software for the journal publishing has to be compatible with OpenAIRE guidelines.⁴⁶ The journals have to be included in the Directory of Open Access Journals (DOAJ).⁴⁷

Publishers of scientific monographs, based in Slovenia, which receive national public funding, should strive to publish the monographs through business models that will enable open access to their full text immediately upon the publication and their licensing with open access licenses (e.g., Creative Commons). The published open access scientific monographs have to be included in the Directory of Open Access Books (DOAB).⁴⁸

⁴⁶ OpenAIRE Guidelines, https://guidelines.openaire.eu/wiki/Main_Page; open source software for journal publishing Open Journal Systems (OJS) is compatible with OpenAIRE guidelines, <https://pkp.sfu.ca/ojs/>

⁴⁷ Directory of Open Access Journals (DOAJ), <http://doaj.org/>

⁴⁸ Directory of Open Access Books (DOAB), <http://www.doabooks.org/>