fct Fundação para a Ciência e a Tecnologia

First National Report on the Implementation of the 2021 Recommendation from UNESCO on Open Science

João Mendes Moreira
Sara Pestana
Filipa Pereira

Contents

A. GENERAL INFORMATION ABOUT THE RESPONDENT

- Country*: Portugal

- Organization(s) or entity(ies) responsible for the preparation of the report*:

  Name: Foundation for Science and Technology (FCT)

  Website: https://www.fct.pt/en

  Please describe the role/mandate of your organization: The Foundation for Science and Technology (FCT) is the national public agency supporting research in science, technology and innovation in all areas of knowledge. It is a special regime public institute under the supervision and oversight of the Ministry of Education, Science and Innovation.

- Officially designated contact person(s) who completed this survey:

  Full name*: João Mendes Moreira

  Position*: Head of Scientific Knowledge Area - FCT

- Full Name(s) of designated official(s) certifying the report: João Nuno Ferreira

- Brief description of the consultation process established for the preparation of the report: The questionnaire was prepared by the FCT, reflecting national initiatives and practices in alignment with the objectives of the UNESCO Recommendation on Open Science. To ensure a comprehensive and inclusive response, FCT subsequently launched a public consultation targeting the broader community and relevant stakeholders involved in the scientific, technological, and higher education landscape.

- Other organization(s) or entity(ies) (including non-governmental) consulted for completing this survey:

  Name of the organization*: University of Coimbra

  Website*: https://www.uc.pt/en/

- Name of the organization*: National Citizen Science Network

  Website*: https://www.cienciacidada.pt/

  Email address* equipa@cienciacidada.pt

B. QUESTIONNAIRE FOR MEMBER STATES' REPORTING ON THE IMPLEMENTATION OF THE 2021 RECOMMENDATION

1. PROMOTING A COMMON UNDERSTANDING OF OPEN SCIENCE, ASSOCIATED BENEFITS, AND CHALLENGES, AS WELL AS DIVERSE PATHS TO OPEN SCIENCE

1.1 Has the 2021 Recommendation been promoted and/or shared with appropriate ministries and institutions as well as affiliated organizations in your country?

Yes. The recommendation was widely disseminated across multiple stakeholders, within reference events. Some examples are as follows:

Portugal's action - Today - Permanent Delegation of Portugal to UNESCO
https://blog.rcaap.pt/2021/05/19/recomendacao-da-unesco-sobre-ciencia-aberta/
https://polen.fccn.pt/2-ciencia/;
https://cfe.uc.pt/ciencia-aberta/;
https://www.fcsh.unl.pt/recomendacoes-da-unesco-sobre-a-ciencia-aberta/;
https://openscience.usdb.uminho.pt/?p=7133;
https://www.uc.pt/openscience/noticias/comunidade-uc-e-convidada-a-participar-da-recomendacao-da-unesco-para-a-ciencia-aberta/?q=recomendação%20da%20unesco.

Some examples of the stakeholders involved in the dissemination of the 2021 Open Science Recommendation are as follows:

- **Ministry of Foreign Affairs:** Under the aegis of this Ministry, the Portuguese National Commission for UNESCO (Port.NatCom) and the Permanent Delegation of Portugal were established. They work to positively contribute to accomplishing UNESCO's major objectives in Portugal, in collaboration with public and governmental entities, groups, associations, and private entities.

  https://unesco.missaoportugal.mne.gov.pt/pt/hoje/acao-de-portugal
  Institutos e centros - A UNESCO - Comissão Nacional da UNESCO.

- **Ministry of Science, Technology, and Higher Education and current Ministry of Education, Science and Innovation**: This Ministry is pivotal in formulating and implementing policies related to science and technology in Portugal. It plays a significant role in promoting open science principles and aligning national policies with international recommendations through awareness-raising and community training activities.

  o **Foundation for Science and Technology (FCT)**: Operating under the above-mentioned Ministry, FCT is the main public agency responsible for funding and supporting research in Portugal. It actively promotes open access to scientific data and publications, aligning with UNESCO's recommendations.
  https://www.fct.pt/en/sobre/politicas-e-estrategias/politicas-de-ciencia-aberta/outros-recursos/.

  o **FCCN, Digital Services of FCT**: This unit focuses on providing digital infrastructures and services to the national research and education community. It supports several initiatives

related to open science, including open science services and infrastructures, ensuring an alignment with international guidelines.
https://blog.rcaap.pt/2021/05/19/recomendacao-da-unesco-sobre-ciencia-aberta/;
https://polen.fccn.pt/2-ciencia/.

- **Universities and Research Performing Institutions**: Several Portuguese institutions are actively involved in promoting open science practices and initiatives to align with UNESCO's recommendations, fostering a culture of openness in research. Some examples can be found in the following links:

    https://cfe.uc.pt/ciencia-aberta/;
    https://www.fcsh.unl.pt/recomendacoes-da-unesco-sobre-a-ciencia-aberta/;
    https://openscience.usdb.uminho.pt/?p=7133;
    https://openscience.ipsantarem.pt/wp-content/uploads/2023/10/Recomendacao-UNESCO-CienciaAberta.pdf;
    https://www.uc.pt/openscience/.

1.2   Is the 2021 Recommendation on Open Science available in the national language(s) of your country?

Yes, in Portuguese.

1.3   Have there been awareness raising activities on open science, including all its key elements[i], associated benefits and challenges, organized or foreseen to be organized by the end of 2025 in your country by national authorities or entities? *(ref.:* **(i) 16.f, 16.g, 16.h***)*

Yes

- **Lusophone Open Science Conference (ConfOA):** Annual conference that aims to bring together the Portuguese and Brazilian communities, as well as those from other Portuguese-speaking countries, who carry out research, development, service management and definition of policies related to Open Science. In 2023, Ana Persic (Programme Specialist) presented an oral talk entitled "Advancing the Transition to Open Science: The Role of the UNESCO Recommendation on Open Science".
  https://confoa.rcaap.pt/2023/programa2023/;
  https://confoa.rcaap.pt/2024/confoa2025-chamada-publica-acolhimento-da-16a-conferencia-lusofona-de-ciencia-aberta/

- **International Open Access Week**: The FCCN, Digital Services of FCT, promoted the webinar "Expanding Open Science: New Models, Assessment and Open Data" as part of the celebrations of the International Open Access Week, which aimed to feature a balance of what has been accomplished in this field to date, as well as news and some indicators.
  https://www.fct.pt/en/expansao-da-ciencia-aberta-em-debate-a-25-de-outubro/

- **Jornadas FCCN**: This annual meeting provided by FCT, through FCCN, is addressed to the different communities of users of advanced computing, communication platforms and other digital services that promote, among others, the practice of Open Science.
  https://jornadas.fccn.pt/

- **Pub In**: Promoted by FCT and the University of Minho, this meeting intends to bring together the national editorial community with the aim of developing technical skills, capitalizing on

knowledge and practices, and promoting the sharing of good practices regarding journals and scientific communication for open science. https://www.pubin.pt/2encontropubin/

- **Research data management workshops:** The POLEN, a research data management service from FCT, provides on-demand workshops about the best practices in organizing, sharing, and preserving research data, ensuring compliance with open science principles. These workshops are frequently requested by universities and are tailored to meet the specific needs of the research community. https://polen.fccn.pt/

- **Research Data Management Forum:** Annual event promoted by FCT, through FCCN, and the University of Minho, for debate and sharing of ideas, projects and good practices in research data management. This event seeks to gather the community of professionals and researchers involved in activities to support research data management to develop technical skills, capitalize on knowledge and practices and promote coordination of national initiatives. https://forumgdi.rcaap.pt/sobre/

- **Session about Citizen Science:** "Citizen Science: participation, empowerment, and action of citizens" in the annual event CIÊNCIA2024, promoted by FCT. This was the first time that a session regarding Citizen Science was held in this annual event. It involved the participation of two representatives from the OECD-GSF Expert Group on Citizen Science, practitioners and funders from the Regional Development Coordination Commission, a municipality, a representative from academia and the president of the national network for Citizen Science.

- **Institutional initiatives:** For instance, the University of Coimbra has established Open Science Communities and organizes an annual meeting that brings together these communities. This event serves as a platform to disseminate innovative practices, projects, and reflections, while also fostering knowledge exchange and collaboration across different disciplines and stakeholders within the university. https://www.uc.pt/en/openscience/about/at-uc/open-science-communities-at-uc-2024/

1.4 **Have specific actions been undertaken or are planned to be undertaken by end of 2025 in your country to incorporate the values and principles of open science[iii], in publicly funded research?** *(ref.:* **(i) 16.a, 16.b, 16.c, 16.d, 16.e, 16.h***)*

Yes. Portugal has undertaken and planned several specific actions to incorporate the values and principles of open science in publicly funded research, with significant contributions led by FCT. These actions include:

- **Adoption of Open Science Policies:** In 2014, the FCT introduced its Open Access Policy, which set the foundation for making scientific publications openly accessible. This policy was recently updated and published, reflecting the latest advancements and international standards in Open Access. Building on this, an updated version of the Research Data Policy is set to be released soon, alongside new developments integrating Citizen Science into FCT's activity as a part of a more comprehensive Open Science Framework. https://www.fct.pt/en/sobre/politicas-e-estrategias/politicas-de-ciencia-aberta/

- **Implementation of a National Program for Open Science and Open Research Data:** A structured National Program for Open Science and Open Research Data is being implemented, funded by the Recovery and Resilience Plan (RRP), to establish national and institutional action strategies that maximize the value of the data generated within the scope of research processes (including additional knowledge contributions from citizen science activities), and provide the structures for compliance with national legislation and European directives in this subject.

https://www.fct.pt/en/apoios-prr-ciencia-digital-e-ciencia-capacitacao/

- **Provision of Services and Infrastructures supporting Open Science practices:** Services and infrastructures such as RCAAP, PTCRIS, Pub In, INDEXAR and POLEN, provides digital infrastructures and services to support the management and sharing of open research results.
  https://ptcris.pt/sobre-o-ptcris/;
  https://www.pubin.pt;
  https://www.rcaap.pt/;
  https://www.indexar.pt/#/about;
  https://polen.fccn.pt/

- **Alignment with National and Global Initiatives:**

  o **Plan S**: Supporting the transition to full and immediate open access for scientific publications of publicly funded research. https://www.fct.pt/media/noticias/portugal-and-fct-s-position-towards-plan-s/

  o **Coalition for Advancing Research Assessment (COARA)**: Aligning with CoARA's commitments to action and the debate on research assessment reform within the Portuguese research landscape and institutional diversity. https://coara.eu/working-groups/national-chapters/coara-national-chapter-portugal/

  o **European Open Science Cloud (EOSC)**: Ensuring national open science practices, open innovation and digital transformation alignment with best practices and benchmarks. https://eosc.eu/tripartite-collaboration/portugal

  o **OECD – GSF Expert Group on Citizen Science:** where a new Framework to implement Citizen Science into public policies is being developed. As part of the group, FCT was able to internalize knowledge that may help to incorporate this Framework withing the new policy for Open Science.

- **Training and Capacity Building:** Training workshops and capacity-building initiatives are being conducted for the research community. https://www.nau.edu.pt/en/course/o-essencial-da-gestao-de-dados-de-investigacao/

- **Establishment of Competence Centres for Research Data Management:** Dedicated Competence Centres are being created to provide a specialized national network of support for the management and FAIR research data, among the scientific community. https://www.fct.pt/en/divulgados-os-resultados-finais-da-manifestacao-de-interesse-para-a-criacao-de-centros-de-competencia-para-a-gestao-de-dados-de-investigacao/

- Other entities from the National Scientific and Technological System (SCTN) have also undertaken actions to incorporate the values and principles of open science, by:

  o **Adopting institutional Open Science policies:** 28 Open Access policies published by the end of 2022, from research organizations and sub-units of the research organisations, according to ROARMAP. https://roarmap.eprints.org/view/country/620.html

  o **Monitoring and alignment with national and international initiatives in Open Science:** Some examples are as follows:
  https://zenodo.org/records/10512424;
  https://ams3.digitaloceanspaces.com/cdn-cesem/site-cesem/Estrategia-de-preservacao-digital-do-CESEM.pdf;

https://investigacao.ulusofona.pt/pt/ciencia-aberta.

2. DEVELOPING AN ENABLING POLICY ENVIRONMENT FOR OPEN SCIENCE

2.1 Does your country have a national policy[iii], strategy, or plan of action on science, technology, and innovation (STI)?

No. Portugal does not have a single national strategy on science, technology and innovation, rather has a set of strategies that coordinate and create synergies between one another, namely:

- **National Digital Strategy**

  This strategy is a structured and comprehensive plan, with the ambition of making Portugal a European benchmark in the digital field. It was designed considering the national context and needs, but also with reference to the ambition of the European Framework. Thus, the strategy is aligned with the 'Digital Decade 2030' Program, considering the fundamental dimensions and the digital rights and principles defined by the European Union. This alignment ensures that the digital transition in Portugal is conducted in accordance with European values, such as inclusion, transparency, and the protection of citizens' rights in the digital environment. https://digital.gov.pt/documentos/estrategia-digital-nacional

- **National Digital Skills Initiative e.2030 - Portugal INCoDe.2030**

  The Portugal INCoDe.2030 is an integrated public policy initiative, launched in 2017, which aims to promote digital skills, contributing to a more qualified working population, new ways of work, new roles and professions, innovative products and, therefore, more robust and competitive economic activities. Digital skills are also of the utmost importance for the development of critical and multifaceted thinking, and for promoting inclusion, autonomy, well-being and social justice.

  The program includes five action lines: education and training; qualification and requalification; inclusion; advanced training and, finally, research. https://www.incode2030.gov.pt/en/

- **Research and Innovation Strategy for Smart Specialization**

  This strategy results of a widely exercise within the national innovation system and which sought, in an open manner, contributing to the construction of a strategic vision, defining priorities and respective transformative activities, which accelerate the transition of the economic paradigm in line with the major European challenges. https://ani.pt/en/enei-2030-smart-specialization-what-is-it/

2.2 In your country, is there a policy, or a set of policies and/or legal framework(s) at the national level that address open science or any of its key elements in line with the definition, values and principles outlined in the 2021 Recommendation on Open Science? *(ref.:* **(i) 16.a, 16.b, 16.c, 16.d, 16.e, 16.h***)*

Yes.

- **National Open Science Policy (PNCA 2016):** By 2016, the Government and the Ministry of Science, Technology and Higher Education (MCTES) have defined as a priority the commitment of science to the principles and practices of Open Science. Within this scope, there was a compromise to elaborate and implement a National Open Science Plan.

  o   Guiding Principles 2016: https://www.ciencia-aberta.pt/en/guiding-principles

- o First Report of the executive commission working group for the National Open Science Policy 2016. https://www.ciencia-aberta.pt/en/_files/ugd/a8bd7c_1ca622bff7f34abbad228ac94e1eda16.pdf

  - o Second Report of the executive commission working group for the National Open Science Policy 2016: https://www.ciencia-aberta.pt/_files/ugd/a8bd7c_3274046fc8ce42c78db2ec1707c0a0fd.pdf

  - o Evaluation of Research Careers fully acknowledging Open Science Practices 2017: https://www.ciencia-aberta.pt/en/_files/ugd/a8bd7c_69c82a7c0f9d451abecbbd9813002908.pdf

- **Resolution of the Council of Ministers No 21/2016**: Defines the guiding principles for the implementation of a National Open Science Policy https://diariodarepublica.pt/dr/detalhe/resolucao-conselho-ministros/21-2016-74094659

- **Resolution of the Council of Ministers No 100/2017:** National Strategy for Environmental Education establishes the principles of Open Education, including citizen science as a complementary of administration, municipalities and NGOs https://diariodarepublica.pt/dr/detalhe/resolucao-conselho-ministros/100-2017-107669156

- **Framework for Environmental Education for Sustainability** (Editor: Ministry of Education, 2017) including participatory science & citizen science in the Territory and Landscape theme; targeting from pre to high school https://dge.mec.pt/noticias/educacao-para-cidadania/referencial-de-educacao-ambiental-para-sustentabilidade.

- **Resolution of the Council of Ministers No 108/2017:** Information Technologies and Communication (ITC) Strategy 2020 including the effectiveness of citizen science and open science in decision-making in Measure 6 Transparency and Participation

- Decree-Law no. 60/2018 - Simplification of administrative procedures necessary for the pursuit of research and development activities.

  - o **The authority in charge of the policy:** Presidency of the Council of Ministers.

  - o **Entities involved and the process of development:**

    - ▪ R&D institutions and

    - ▪ Funding entities, namely: FCT, Agência Nacional de Inovação, Agência para o Desenvolvimento e Coesão and the managing authorities of the operational, thematic and regional programs.

  - o **Year of adoption**: 2018

  - o **Key areas of the policy:**

    - ▪ Simplify administrative procedures for research and development activities;

    - ▪ Facilitate scientific and technological progress by reducing bureaucratic obstacles;

    - ▪ Promote efficiency in the execution of research projects.

    https://diariodarepublica.pt/dr/en/detail/decree-law/60-2018-115886130

- Decree-Law No. 63/2019 - Establish a set of rules on the scientific research and technological development institutions (R&D).

- o **The authority in charge of the policy:** The Presidency of the Council of Ministers.

- o **Entities involved and the process of development:** The National Science and Technology System.

- o **Year of adoption**: 2019.

- o **Key areas of the policy:**

  - ▪ Pursue the public interest regarding sciences and research, through the creation of qualified jobs;

  - ▪ Reinforce the relationship between society and the sciences by valuing the sciences' social recognition;

  - ▪ Promote and value the Portuguese cultural identity and scientific heritage;

  - ▪ Encourage private investment in R&D activities.

  https://diariodarepublica.pt/dr/en/detail/decree-law/63-2019-122317422

- Portuguese Roadmap of Research Infrastructures.

  - o **The authority in charge of the policy:** FCT.

  - o **Entities involved and the process of development:** The National Science and Technology System.

  - o **Year of creation**: 2014 **Year of last update:** 2020

  - o **Key areas of the policy:**

    - ▪ Key information on the strategic importance of various research infrastructures across sectors like energy, environment, health, food, and digital sciences;

    - ▪ Ongoing efforts to strengthen Portugal's research capacity, promote international cooperation, and align with EU research frameworks;

    - ▪ New infrastructures of strategic interest and reflect the evolution of national and European research priorities.

- ACT No. 68/2021 - Approval of the general principles on open data and transposes into national law Directive (EU) 2019/1024 of the European Parliament and of the Council of June 20, 2019, on open data and the reuse of public sector information, amending Law no. 26/2016 of August 22.

  - o **The authority in charge of the policy:** The National Parliament.

  - o **Entities involved and the process of development:** The National Science and Technology System.

  - o **Year of adoption**: 2021.

  - o **Key areas of the policy:** Open data and its framework, in terms of principles, characteristics and obligations of the entities subject to it; Identification of changes and additions to Law 26/2016, as a result of the transposition of Directive (EU) 2019/1024. https://diariodarepublica.pt/dr/detalhe/lei/68-2021-170221042

- Open Access Policy for Scientific Publications resulting from R&D Projects Financed by FCT.

  - o **The authority in charge of the policy:** FCT.

- o **Entities involved and the process of development:** The Open Access Policy for publications resulting from FCT-funded research mandates that researchers deposit peer-reviewed publications in repositories of the RCAAP network, ensuring immediate availability of metadata and compliance with open access licenses, such as Creative Commons CC-BY. Publications must be made available as soon as possible, with embargo periods of up to 12 months for some fields. Books, chapters, and doctoral theses must also be deposited with specific embargo periods.

  - o **Year of creation**: 2014 **Year of last update:** 2025.

  - o **Key areas of the policy:** Publications of scientific results, which are subject to peer review or peer review or other form of scientific review, should be deposited in one of RCAAP's Open Access repositories as soon as possible, preferably at the time of acceptance of the publication.

    https://www.fct.pt/wp-content/uploads/2023/01/PoliticaAcessoAberto_Publicacoes.pdf;
    https://www.fct.pt/wp-content/uploads/2025/02/Politica-Acesso-Aberto-FCT.pdf

- Policy on making available data and other results of scientific research funded by the FCT.
  - o **The authority in charge of the policy:** FCT.
  - o **Entities involved and the process of development:** The National Science and Technology System.
  - o **Year of adoption**: 2014 **Year of last update:** estimated soon, 2025
  - o **Key areas:** FCT encourages researchers to adopt good research data management practices and to share their results with the scientific community.

    https://www.fct.pt/wp-content/uploads/2023/01/PoliticaAcessoAberto_Dados.pdf

- **Resolution of the Council of Ministers No 40/2024:** Revitalization Programme of the Serra da Estrela Natural Park considers two projects with citizen science activities related to the habitat recovery (3 1500 000€) and the local tourist profile (1 520 000 €) https://diariodarepublica.pt/dr/legislacao-consolidada/resolucao-conselho-ministros/2024-860106900

2.3 In your country, are there specific policy instruments[v] that aim to promote open science?

Yes.

- **Title of the instrument**: Open Science Policies
  - o **Objective:** The FCT, as the funding entity of the national scientific and technological system, through R&D projects, R&D institutions, studentships, scientific jobs and research infrastructures, is committed to promoting the practice of Open Science in all its funding instruments.
  - o **The authority in charge:** The Foundation for Science and Technology, I. P. (FCT, I. P.)
  - o **Allocated budget:** Specific, according to each funding instrument
  - o **Elements of open science included:**
    - Open Access to scientific publications
    - Open access to research data

  https://www.fct.pt/en/sobre/politicas-e-estrategias/politicas-de-ciencia-aberta/

2.4 In your country, is there a national implementation plan, strategy, policy or a roadmap for implementation of open science at the national level in line with the 2021 Recommendation? *(ref.:* **(ii) 17.a, 17.b, 17.c, 17.f, 17.h***)*

No. Portugal does not currently have a national strategy plan for open science. Nevertheless, FCT, as the main national funding organization for research, has integrated open science values and principles into its annual strategic plan. The Scientific Knowledge Area of FCT is responsible for implementing the targeted plans to advance open access and open data practices, such as:

- **Plan and Strategy for Open Access to Scientific Publications**

  The FCT adopted an open access policy for scientific publications in 2014, motivated by developments in European Strategies, Directives and Regulations in open science. More recently and by adherence to Plan S and the development of diamond open access related services (e.g., PubIn, SciELO Portugal, SARC) and open infrastructures (PTCRIS, RCAAP, institutional repositories, PIDs, AAI), the policy is under review to ensure that all publications (scientific articles, books, theses and dissertations) resulting from publicly funded research are accessible without restrictions. This open access policy was reviewed and recently published. Taking leverage of the plan of National Open Science Policy (2016), FCT will continue to strengthen partnerships with international organizations and initiatives, such as cOAlition S, UNESCO, Science Europe, ICOLC (International Coalition of Library Consortia), by aligning with global standards and sharing best practices.

- **Plan and Strategy for Open Access to Research Data**

  The National Programme for Open Science and Open Research Data (PNCADAI) aims to support the scientific community by providing tools, services, and infrastructure to facilitate the transition to digital science and technology, and by creating and establishing a national network to support research data management. The FCT plan involves the implementation of digital services to support the management of research data in each step of its life cycle; the development of storage and backup infrastructures; and digital services that support FAIR data, such as persistent identifiers, indicators of open science and monitoring and compliance services. It promotes the principles of Open Science, encouraging the reuse of research results and the dissemination of scientific knowledge. The plan ensures compliance with national and international standards, including the European Open Science Cloud (EOSC), Research Data Alliance (RDA) and the FAIR data principles.

- **Plan and Strategy for Models of scientific communication**

  The FCT has also been working on new models of science communication to address key issues in the dissemination of scientific knowledge, promoting equity, sustainability, speed, and transparency. Based on Plan S principles, transformative agreements have been negotiated through b-on (Online Knowledge Library), a FCT service, to encourage publishers to switch to an open access publishing model. Moreover, FCT aims to continue to support and align with Diamond Open Access initiatives, such as the European Diamond Capacity Hub, and to develop and promote national initiatives, such as Pub In.

  Other models of scientific communication have also been promoted by FCT among the scientific community, such as subscribing to Open (S2O) and the Rights Retention Strategy.

  Further details are available in section 2.6.4 of the FCT activity plan. https://www.fct.pt/wp-content/uploads/2024/01/PA2024.pdf

2.5 **In your country, are there policies and/or strategies that promote open science in line with the 2021 Recommendation at institutional level, including in the context of research-performing institutions, universities, scientific unions and associations and learned societies?** *(ref.:* **(ii) 17.d, 17.e, 17.g***)*

Yes. The national legislation (RCM nº 21/2016) delegated in the institutions the aspects of promotion of Open Science. Consequently, an increasing number of institutions have adopted Open Science policies, with many others actively in the process of developing their own. However, it is not possible to provide a concrete number.

For more information, please refer to:

- ROARMAP:
  https://roarmap.eprints.org/view/country/620.html
- FAIRsharing Policies:
  https://fairsharing.org/search?fairsharingRegistry=Policy&q=portugal

2.6 **In your country, are there specific funding mechanisms[vi] for open science at the national level?** *(ref.:* **(ii) 17.j, (iii) 18.j, (iv) 19.c***)*

Yes.

- **National Programme for Open Science and Open Research Data | Competence Centers**

  FCT is actively promoting open science through the National Programme for Open Science and Open Research Data (PNCADAI) by launching two calls for the creation of a national network for research data management. This initiative involves an investment of around 4 million euros, including: 14 Competence Centers and 1 Consortium.
  https://www.fct.pt/en/sobre/manifestacoes-de-interesse/

- **Provision of Services and Infrastructures supporting Open Science practices**

  FCT directly funds the implementation and management of digital services and infrastructures dedicated to open science, such as RCAAP, PTCRIS, Pub In, INDEXAR, POLEN, b-on and NAU.
  https://www.fccn.pt/en/areas-tecnologicas/conhecimento/ciencia-aberta/

2.7 **In your country, have open science practices[vii] been integrated into existing research funding mechanisms?**

Yes. Open Science practices have long been encouraged for all beneficiaries of FCT research funding mechanisms, through FCT policies. Moreover, with the revision of the new Open Science policies, the requirements for Open Access outlined in the Open Access Policy for Scientific Publications resulting from R&D Projects Financed by FCT, as detailed in section 2.2. became mandatory for FCT beneficiaries. This change brings FCT's policies into closer alignment with those of other European funding agencies, ensuring consistency and fostering the adoption of Open Access principles across the research landscape.

There are other funders at national level, such as the "Fundação La Caixa", which also promotes the adoption of Open Science practices.
https://www.fct.pt/en/sobre/politicas-e-estrategias/politicas-de-ciencia-aberta/
https://www.fct.pt/en/concursos?tab=open&paged=1

2.8   Have efforts been made or are foreseen to be undertaken by end of 2025 in your country to foster equitable public-private partnerships on open science in line with the 2021 Recommendation? *(ref.:* **(ii) 17.i***)*

Yes. The FCT fosters private-public partnerships through various initiatives, for instance European Partnerships under the Horizon Europe Framework Program (HE). These partnerships serve as critical tools to address some of Europe's most pressing challenges through coordinated R&I initiatives between private and public partners.
https://www.fct.pt/en/internacional/espaco-europeu-de-investigacao/parcerias-europeias-horizonte-europa/

2.9   Is there a national monitoring framework for open science in your country? Or are there specific indicators on open science included in the national monitoring and evaluation framework for STI policy *(ref.:* **(ii) 17.j**, **23.c***)*

Under development. FCT is actively developing services that aim to provide comprehensive oversight of Open Science practices within the national research ecosystem.

An Open Science Indicators Service will consolidate data from multiple information systems to generate key metrics on scientific funding, research output, and open access adoption. It will offer detailed insights into trends in Open Science, including compliance with Open Access policies, transformative agreements, and publication costs (APCs). These indicators will be accessible via intuitive dashboards, supporting evidence-based decision-making for researchers, institutions, and policymakers.

The trackerFCT, a monitoring and tracker system, will complement this framework by actively monitoring compliance with FCT's Open Science policies. It will identify non-conformities in funded research outputs, inform the grantees, and provide mechanisms for corrections.

This dual function will enable FCT to assess policy effectiveness and promote alignment with Open Science principles while encouraging grantees to adopt best practices.

3. INVESTING IN OPEN SCIENCE INFRASTRUCTURES AND SERVICES

3.1   What is the latest official data for your country's percentage of national gross domestic product (GDP) dedicated to research and development expenditure? Please also indicate the year of publication of this data, and to which year(s) it refers. *(ref.:* **(iii) 18.a***)*

According to the Directorate-General for Education and Science Statistics (DGEEC), the provisional results of the 2023 National Scientific and Technological Potential Survey (IPCTN), reveal that Portugal has reached 4.523 billion euros in total expenditure on Research & Development (R&D) activities. This corresponds to 1.70% of the national GDP and represents a 10% increase compared to 2022.

3.2   What is the latest official data for the percentage of your country's population that have access to reliable internet and bandwidth? Please also indicate the year of publication of this data, and to which year(s) it refers. *(ref.:* **(iii) 18.b***)*

According to the latest data from Statistics Portugal, 90.6% of households in Portugal have internet access at home, with 87.0% having a broadband connection. Connections using fixed technologies (84.6%) continue to be predominant, compared to mobile technologies (49.7%).

Please refer to:
https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_destaques&DESTAQUESdest_boui=646
170695&DESTAQUESmodo=2

3.3 Are there national research and education networks (NRENs)[viii] active in the country? *(ref.:* **(iii) 18.c***)*

Yes. Portugal has an active National Research and Education Network (NREN), the Science, Technology, and Society Network (RCTS), which is managed by the FCCN, Digital Services of FCT.

The RCTS corresponds to the country's digital infrastructure for connectivity and computing, supporting the research and education community. The RCTS provides national institutions with access to advanced digital services, enabling the development of national projects and facilitating integration with international research initiatives and resources.

The RCTS is accessible to higher education institutions, state laboratories, associated laboratories, research and development units (R&D units), and other units within the national science and technology system. This wide accessibility ensures that a broad spectrum of research, academic, and scientific institutions can collaborate effectively, nationally and globally, through the RCTS network.
https://www.fccn.pt/en/a-fccn/rede-rcts-rede-ciencia-tecnologia-e-sociedade/

3.4 Are there national or institutional open science infrastructures[ix] in your country? *(ref.:* **(iii) 18.d, 18.e, 18.k, 18.l, 18.m***)*

☒ **Federated information technology infrastructure for open science, including high-performance computing, cloud computing and data storage**

☒ **Community managed infrastructures, protocols and standards, for example those that support bibliodiversity and engagement with society**

☒ **Platforms for exchanges and co-creation of knowledge between scientists and society**

☒ **Community-based monitoring and information systems to complement national, regional and global data and information systems**

- **National Network for Advance Computing:** is managed by FCT and is designed to provide advanced computing services to the research, technology and innovation communities. It was created by the digital skills initiative Portugal INCoDe.2030 https://rnca.fccn.pt/en/

- **Open Clouds for Research Environments (OCRE):** managed by FCCN, it enables access to advanced cloud services for public and private institutions. https://www.fccn.pt/en/areas-tecnologicas/computacao/ocre/

- **Scientific Journals Hosting Service (SARC)**: designed to support the online publication and management of scientific journals. It operates on the Open Journal System. Non-commercial. https://revistas.rcaap.pt/

- **Scientific Electronic Library Online (SciELO) Portugal:** provides access to a curated collection of scientific journals. SciELO aims to develop a common methodology for the

preparation, storage, dissemination, and evaluation of scientific production in electronic format. Non-commercial, focusing on the dissemination and preservation of scientific knowledge for the benefit of the academic and research communities. https://www.pubin.pt/scielo-portugal/

- **Open Access Scientific Repositories of Portugal (RCAAP):** aggregates and indexes OA scientific content from various Portuguese institutional repositories. Single-entry point for searching and discovering a wide range of scholarly publications, including journal articles, conference papers, theses, and dissertations. Non-commercial, and it is open to all institutions in scientific and higher education system. https://www.rcaap.pt/about.jsp

- **Online Knowledge Library (b-on)**: provides institutions with access to journals and eBooks from scientific content providers. For higher education institutions, public and private research organizations, public administration institutions, non-profit private institutions, and hospitals. Non-commercial and operates with a centralized negotiation model, which helps rationalize costs and ensures broad access to scientific resources. https://www.b-on.pt/en/

- **Digital Resources of Knowledge (Indexar)**: directory of national digital repositories and journals in the fields of science, technology, and culture, providing information on their compliance with legal frameworks, such as legal deposit and open science policies from FCT. https://www.indexar.pt/#/home

- **National Register for Digital Objects:** collects bibliographic metadata from Portuguese providers, and exposes the datasets for European ingestion, assuring the best quality of content and metadata. https://rnod.bnportugal.gov.pt/rnod/

- **National Citizen Science Network:** informal network that brings together communities involved in citizen science initiatives and projects in Portugal. https://www.cienciacidada.pt/

- **Pub In**: aims to promote the integrated management of Portuguese OA scientific journals in national and international directories, modernize editorial management platforms, and support the adoption of OS practices such as open peer review and open annotations. Non-commercial. https://www.pubin.pt/sobre-2/

- **POLEN**: service aims to support the needs of the scientific community in the context of RDM, ensuring the sharing and preservation of research data generated from publicly funded projects. Actively developing advanced data storage and backup infrastructures. https://polen.fccn.pt/

- **National Current Research Information System (PTCRIS)**: designed to facilitate the management, production, and access to information about the country's scientific activities. Ensures the availability of reliable and up-to-date information on scientific endeavours. Non-commercial https://ptcris.pt/

- **Citizen Science Projects' Platforms, managed at local level** (Examples: Invasora.pt: https://invasoras.pt/en/mapeamento; MosquitoWEB: https://mosquitoweb.ihmt.unl.pt/; Memory for all: https://memoriaparatodos.pt/; P**olli**.NET: https://www.pollinet.pt/reposit%C3%B3rio)

- University of Coimbra platforms: Mondaecus and Digital Joanina Library contribute for the bibliodiversity at the institutional level.

3.5   Does your country host or fund any federated regional or international information technology infrastructure for open science? *(ref.:* **(iii) 18.e,** **18.f***)*

Yes. Portugal is actively involved in federated international information technology infrastructures. FCT's commitment to open science is reflected in the increasing number of Portuguese journals

listed in a trusted global resource for high-quality open access journals - the Directory of Open Access Journals (DOAJ). The FCT is also funding thematic initiatives, such as the Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP3).

Additionally, FCT, through its Digital Services FCCN, has implemented OpenAIRE guidelines into national repositories aggregated in RCAAP, using the DSpace OAI-Extended Addon, and integrated OpenAIRE API with RCAAP, promoting systems interoperability.

FCT also participates in the European Diamond Capacity Hub (EDCH) and funds related national initiatives, such as Pub In (referred in 3.4.3). At the institutional level, several insitutions are also involved in Diamond OA initiatives. For example, the University of Coimbra is an active member of the CRAFT-OA European project and a member of the executive assembly of OPERAS, which aim to consolidate the Diamond OA publishing landscape and to full implementation and sustainability of EDCH, respectively.

Furthermore, FCT is exploring the potential to fund initiatives such as OpenAlex, which provide a freely accessible API and datasets that promote the reuse of scholarly research and contribute to the global open science ecosystem. Additionally, FCT is considering endorsing the Barcelona Declaration on Open Research Information, further solidifying its commitment to transforming the way research information is produced and utilized.

3.6   Is your country involved in any North-South, North-South-South and South-South collaborations to optimize infrastructure use and joint strategies for shared, multinational, regional and national open science platforms? *(ref.:* **(iii) 18.g***)*

Yes.

- **European Open Science Cloud participation**

    The FCT is a mandated organization of the European Open Science Cloud Association (EOSC-A), and therefore responsible for representing Portugal's interests in EOSC-A, with a bidirectional approach. In addition to support EOSC's development, FCT serves as a National Contact Point (NCP), ensuring effective communication with the national scientific community. FCT also coordinates resources within national structures and networks to support activities aligned with EOSC's objectives.
    https://eosc.eu/members/foundation-for-science-and-technology-fct/

    Moreover, other national R&D institutions are also involved in EOSC as members, namely the University of Coimbra and the University Institute of Lisbon (ISCTE).
    https://eosc.eu/members/instituto-universitario-de-lisboa-iscte/
    https://eosc.eu/members/university-of-coimbra/

- **Portugal and Brazil collaboration**

    Since 2009, Portugal and Brazil, through their respective Ministries of Science and Technology, have collaborated extensively in the area of Open Access. This collaboration was formalized through a Memorandum of Understanding (MoU) aimed at strengthening scientific outreach and fostering joint efforts in science, technology, and culture. One of the key outcomes of this partnership was the establishment of the annual Lusophone Open Science Conference (ConfOA), which serves as a platform for sharing knowledge and advancing open science practices across Portuguese-speaking countries.

More recently, a new MoU was signed involving the Ministry of Health, Ministry of Science, Technology and Higher Education, Ministry of Economy and the Sea, and the Oswaldo Cruz Foundation (Fiocruz). This agreement is focused on promoting a vibrant scientific culture in both nations, attracting young talent to science, and encouraging public engagement. It also emphasizes the preservation of cultural heritage and fosters collaboration through joint initiatives between museums, science centers, schools, and scientific institutions in Portugal and Brazil.

https://expresso.pt/internacional/2023-04-22-Brasil-e-Portugal-assinaram-10-protocolos-o-objetivo-e-aprofundar-as-relacoes-bilaterais-ee34ce29

- **Portugal and Latin America collaboration**

The FCT and La Referencia - La Red Federada de Repositorios Institucionales de Publicaciones Científicas in South and Central America have signed a Memorandum of Collaboration to enhance cooperation in sharing scientific knowledge between Portugal and Latin American countries. This partnership includes nations such as Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Peru, and Uruguay. As part of this agreement, the RCAAP Portal (Portugal's Open Access Scientific Repositories) will now be able to aggregate content from institutional repositories within the La Referencia network, and vice versa.https://www.fct.pt/wp-content/uploads/2022/06/2019_09_17_NI_Ciencia_Aberta_entre_Portugal_e_paisesda_America_Latina.pdf

The FCT, through FCCN, and the University of Minho, have signed a National Cooperation Agreement with the Redalyc Scientific Information System, which aims to boost the quality and visibility of Diamond Open Access journals. This agreement strengthens the promotion and support of national scientific research and is particularly important as the FCT is the first national government institution with which Redalyc has established a collaboration agreement. https://www.fccn.pt/en/atualidade/fct-universidade-minho-assinam-acordo-redalyc/

4. INVESTING IN HUMAN RESOURCES, TRAINING, EDUCATION, DIGITAL LITERACY AND CAPACITY BUILDING FOR OPEN SCIENCE

4.1 Has systematic capacity building on open science taken place in higher education and/or research performing institutions in your country? *(ref.:* **(iv) 19.a, 19.c***)*

Yes.

- **Institutional level**

Capacity building and formal initiatives, including mandated training, established and repeated workshop series, or sessions that provide academic credit or certification, are usually organized by each research performing institution. While there's not an available comprehensive list of all the initiatives, many higher education and research institutions in the country offer open science related programs, often tailored to the specific needs of the institution and its research community.

Please find bellow some examples:
https://openscience.usdb.uminho.pt/?p=9234
https://sigarra.up.pt/fpceup/pt/noticias_geral.ver_noticia?P_NR=62957
https://www.uc.pt/iii/ensino/formacoes-iiiuc/ciencia-aberta/

https://www.ua.pt/pt/sbidm/formacao-semestres-anteriores

Higher education institutions and R&D units are progressively adopting open science practices, participating in European projects and offering capacity-building opportunities to their communities. For instance, the University of Coimbra leads the ERA Chair project EXCELScIOR (EXCELlent Science with Impact, Open and Reliable), funded by Horizon Europe (2024-2029). The project's mission is to develop the research potential of the university by capacity-built a dedicated Meta-Research team to promote reproducibility, interdisciplinarity, and Open Science practices. https://excelscior.uc.pt/

Despite these promising examples, there remains a pressing need to further raise awareness and expand the integration of Open Science practices across the broader academic and research landscape in Portugal. Systematic approaches to capacity building, particularly at the institutional level, would ensure that Open Science becomes a fundamental component of the national research culture.

- **National Level**

FCT offers on-demand training sessions on its digital services and infrastructures, provided by FCCN, empowering the research community to maximize their benefits, foster greater engagement, and ensure alignment with open science principles. These workshops, often requested by universities, are customized to address the specific needs of researchers.

4.2 Have capacity building programmes for policy makers on how to integrate <u>core values</u> and <u>principles</u> of open science in STI policies and strategies taken place in your country?

No. Although there are currently no specific capacity-building programs for policymakers in Portugal focused exclusively on integrating the core values and principles of Open Science into STI policies and strategies, efforts are being made to align with global standards and initiatives.

Policy makers in Portugal are actively monitoring important national and international initiatives and continually updating best practices in research. Several national institutions, including FCT, regularly participate in Open Science working groups and programs, contributing to the adoption and dissemination of Open Science principles.

At the institutional level, there are examples of active involvement in Open Science policies and strategies. For instance, the University of Coimbra is a member of the PALOMERA project, funded by the European Union under the Horizon Europe program for the years 2023–2024. This project aimed to address the gap in Open Access funder policies for books and to provide actionable recommendations to increase the inclusion of books in Open Access policies.

4.3 Has a framework of open science competencies been incorporated into higher education research skills curricula in your country, or is it foreseen by the end of 2025? *(ref.:* <u>(iv) 19.b</u>*)*

Yes.

- **Institutional level**

Many higher education and research-performing institutions in the country offer specialized training programs in key areas such as open science, data management, and research ethics, helping to ensure that researchers and students are equipped with the necessary skills.

However, we do not have a comprehensive list of all programs or information on how they are fully integrated into the curricula.

- **National level**

  The NAU platform provides open educational resources across various fields, including the MOOC "The Essentials of Research Data Management." This course offers researchers and doctoral students a certificate, equipping them with a comprehensive and practical understanding of the processes involved in data management throughout the research lifecycle.

  Moreover, as part of the scope of the National Programme for Open Science and Open Research Data (PNCADAI), a Consortium to be established is expected to deliver: a training program for thematic/institutional Research Data Management Centers, and a national research data management training program, focusing on the train-the-trainer approach. These initiatives aim to provide structured and comprehensive training on research data management, supporting the integration of open science competencies into academic and research settings by the end of 2025.

4.4 **Are open educational resources[x] as defined in the <u>2019 Recommendation on Open Educational Resources</u>, used as an instrument for open science capacity building in your country in line with the 2019 Recommendation mentioned above?** *(ref.:* <u>(iv) 19.d</u>*)*

Yes.

4.5 **Have there been any initiatives in your country to support science communication in line with open science value and principles with a view to the dissemination of scientific knowledge to researchers of different disciplines, decision-makers and the public at large?** *(ref.:* <u>(iv) 19.e</u>*)*

Yes.

- **Ciência Viva** – Ciência Viva is the Portuguese entity identified to be responsible for the promotion of the scientific culture and communication of science to the public. [Defined in Decree-Law No. 63/2019, mentioned in 2.2].

- **Portuguese Science Summit** – The Portuguese Science Summit is the largest annual event in the field of science and technology in Portugal, promoted by FCT in collaboration with the National Agency for Scientific and Technological Culture - Ciência Viva, and with the institutional support of the Minister of Science, Technology and Higher Education and the Parliamentary Committee on Education, Science, Youth and Sports. This meeting aims to foster a broad debate on the key topics and challenges of the scientific agenda, encouraging participation and interaction between researchers, the business sector, and the public in a major forum eagerly anticipated each year by the scientific community. Every year, scientific institutions—including R&D units, CoLABs, Associate Laboratories, and State Laboratories—are invited to actively participate in the program by submitting proposals for presentations, scientific posters, and demonstrations of R&D activities. https://www.encontrociencia.pt/en/

- **National Citizen Science Network** – please refer to 3.4

- **The Portuguese Reproducibility Network (PTRN)** – PTRN is a peer-led consortium dedicated to promoting the adoption of replicable, transparent, robust, and rigorous research practices across all scientific disciplines in Portugal. We collaborate directly with researchers at their local

nodes to support these practices. Additionally, we work with institutions to help them foster responsible, robust, and transparent research approaches. Our efforts also extend to coordinating with stakeholders across the sector to align and enhance these initiatives. https://www.ptrn.pt/

- **Research Data Management Forum** – referred in the 1.3

- **Research Data Management Forum | Working Groups** – Beyond being an annual event for presenting projects, discussing emerging issues, and organizing workshops, the RDM Forum has established working groups dedicated to specific topics. These groups focus on areas such as research data repositories; training and competencies for FAIR data management; and policies, strategies, and recommendations for RDM.
  https://forumgdi.rcaap.pt/grupos-de-trabalho/gt-repositorios-de-dados/
  https://forumgdi.rcaap.pt/grupos-de-trabalho/gt-formacao/
  https://forumgdi.rcaap.pt/grupos-de-trabalho/gt-politicas-gdi/

- **Lusophone Open Science Conference (ConfOA)** – please refer to 1.3

- **Jornadas FCCN** – please refer to 1.3

- **International Open Access Week** – Several national institutions assume the Open Access Week as an opportunity to create awareness and to continue to learn about the potential benefits of Open Access, and to help inspire wider participation in helping to make Open Access a new norm in scholarship and research.
  https://www.fccn.pt/media/2024/11/Webinar-Semana-CA-2024_completa.pdf
  https://www.iscal.ipl.pt/eventos/semana-internacional-de-acesso-aberto-open-access-week-2024
  https://portal.uab.pt/conferencia-23-de-outubro-programa/

- **Legislation and regulations** – At national level, there were legislative efforts to enable better conditions for the implementation of Open Education and Citizen Science practices within the educational system and the local ecosystem. For example:

  o The Resolution of the Council of Ministers No 100/2017: National Strategy for Environmental Education and the Framework for Environmental Education for Sustainability (mentioned at Q. 2.2).

  o User Regulations for the library of the University of Minho (BPB) (Dispatch nº 7094/2021, 2021) – allowing the general public to access the library to consolidate citizen science.

  o Regulation of affected equipment to the Organic unit of the Centre for Environmental Monitoring and Interpretation of the municipality of Viana do Castelo (Regulation nº 693/2024).

5. FOSTERING A CULTURE OF OPEN SCIENCE AND ALIGNING INCENTIVES FOR OPEN SCIENCE

5.1 Have there been any initiatives at the national or institutional level, e.g. by universities and/or research performing institutions, to review the existing research assessment and evaluation processes to align them with open science principles and values or are they foreseen by the end of 2025? *(ref.:* **(v) 20.b, 20c, 20i***)*

Yes.

- **National Chapter of CoARA**

    The FCT, nine Portuguese universities and eight research performing institutions have been involved in the Coalition for Advancing Research Assessment (CoARA), a collective of organizations committed to reforming research evaluation methods by recognizing a wider array of researcher contributions, beyond traditional publication-based metrics.

    The Portuguese National Chapter of CoARA serves as a collaborative platform that enhances CoARA's commitments and fosters the debate on research assessment reform within Portugal's diverse research landscape. It brings the CoARA Agreement to the forefront of national initiatives, promoting greater adherence to open science principles in research evaluation.

    The main objectives of the Portuguese National Chapter include raising awareness of the CoARA principles, enabling mutual learning among member institutions, and advancing the development of action plans and roadmaps. The chapter also promotes research on research activities, particularly focused on improving peer review processes and developing alternative assessment criteria. Furthermore, the National Chapter collaborates with other CoARA's national chapters and working groups, sharing insights and contributing to the broader reform of research evaluation. Additionally, the chapter analyzes how CoARA's commitments align with national legislation and identifies any barriers to implementation while working to establish synergies with broader European research goals. https://coara.eu/working-groups/national-chapters/coara-national-chapter-portugal/

    - o At the institutional level, the University of Coimbra is participating in the TREASURE project (Transforming Research Assessment through Responsible Research training of Early-Stage Researchers: An institutional pilot study). TREASURE is an institutional pilot project that aims to reward master's and PhD candidates **for integrating reproducible**, reusable, and open research practices into their thesis research. This project aligns with the 10 commitments outlined in the Agreement on Reforming Research Assessment, established by the CoARA. https://www.uc.pt/en/iii/treasure/

- **FCT Working Group**

    The co-chair of the National Chapter of the Coalition for Advancing Research Assessment (CNP-CoARA) is also the national expert following the implementation of European Research Area Action 3. He is also an advisor to the FCT Board of Directors, giving him a direct role in leading and being involved in the ongoing efforts to reform research evaluation in the national funding agency.

    This FCT working group aims to reform research assessments and evaluation processes nationally and, consequently, increase the quality of research and the recognition of its multiple contributions to the various sectors of society.

- **OECD-GSF Citizen Science Expert Group**

    FCT participates in the OECD-GSF Citizen Science Expert Group, which is developing a framework for the implementation of Citizen Science in public policies. As part of this initiative, a Country Note has been prepared, providing a comprehensive review of relevant national legislation and resources. While it is not yet confirmed whether this information will be made public, it will be incorporated into the next OECD STIP Compass exercise to inform broader policymaking efforts.

5.2 **Have specific clauses that recognize open science practices, including sharing, collaborating and engaging with other researchers and societal actors beyond the scientific community, or dialogue with other knowledge systems, been incorporated in the career evaluation and progression systems or are foreseen by the end of 2025?** *(ref.:* **(v) 20.a, 20.c, 20.d***)*

Yes/Under development.

- **Broad adoption of narrative CV model**

    Following a pilot implementation of a new Narrative CV format, FCT has introduced it in all its calls for researchers, teams, and institutions (adoption of Narrative CV for research units' core CVs), in alignment with the Agreement and Commitments of Coalition for Advancing Research Assessment (CoARA), namely Commitment 1.

    This model promotes responsible research assessment by broadening the recognition of researchers' profiles and their contributions beyond traditional metrics. It encompasses various forms of research outputs such as publications, datasets, software, methods, exhibitions, and societal impact, reflecting the diverse ways in which researchers advance science and society.

    Please refer to:

    https://myfct.fct.pt/LibDocument/FileDisplay.aspx?EcrypDoctId=ocSoN5+Wv24gEnivBgQPZv7 Dqz4iUsI67Hfh/HFHIeUHKo1EluGNdl9GOYhJ0iRQuJoRaCfyHoF0U1H6/K4QSbdBlBTB3opx 4foJr1tTlHfI9NlXxRgUGQ8WtB01/ZderMXQ2vvamQPUmY0BfCOV4fN1b4I82jumCrcCruTZLh 8=

    Additionally, FCT advises Evaluation Panels not to rely on metrics as a surrogate for evaluating the quality and impact of research, further supporting a more holistic and inclusive approach to research assessment.

    Please refer to:

    https://myfct.fct.pt/LibDocument/FileDisplay.aspx?EcrypDoctId=ocSoN5+Wv24gEnivBgQPZsZ SkLl/v/GjbDNlYkfwGP09pVq0XcJdA2k5h5YQE9FQPGLlEO/oob1vUpckwcDunp0OqieDd/Z8 MOiEfkxRwwKHPQeGk+/GvU4zlxaGtwRWiNTniKu/PoT4oKfawzIU973doW5w0Pr75bdv/6UG LPA=

- **Revision of the Scientific Research Career Statute (ECIC)**

    The ongoing revision of the Scientific Research Career Statute, currently under discussion in the Portuguese Parliament, provides a more comprehensive recognition of the diverse profiles and contributions that shape the concept and roles of researchers.

- **Compliance with Open Science Policy**

    In FCT calls for research and development projects, is requested to the Principal Investigator (PI) to sign a statement of commitment ensuring that "open access to scientific publications (peer-reviewed) resulting from funding investment within the scope of the announcement of the call, is in agreement with the Fundação para a Ciência e a Tecnologia, I.P Open Access Policy."

    https://myfct.fct.pt/LibDocument/FileDisplay.aspx?EcrypDoctId=ocSoN5+Wv24gEnivBgQPZke YT/FDCtqXRI826SbOssMGgV+pJA7Dlb9ANUIXqGZLElQNtp9eSev2wp0oX7UEWaYJXo/vyH znJM0niT3NDiayBbGrYckDV9eAVAyfIpZXeAvn4AhGzx7xBX55+YpC/zbJLTxcU7ipHI6a2w86 oQQ=

Moreover, further revisions and the incorporation of additional clauses are anticipated. These revisions will be aligned with the forthcoming FCT's Open Science policies. Once these policies are in place, it is predicted that more comprehensive clauses will be integrated into career evaluation and progression systems, further emphasizing the importance of open science practices, collaboration, and engagement beyond the scientific community.

Similar procedures may be implemented for the Citizen Science component, including the incorporation of this principle in funding requirements and scientific evaluation aspects.

- **Institutional level**

Some higher education institutions and R&D units are also implementing measures to recognize or require citizen science experience in the evaluation of CVs for scientific recruitment, including positions such as teachers, researchers, and managers. For example:

- o University of Aveiro (Notice no. 794/2018),
- o Faculty of Sciences of the University of Lisbon (Notice no. 12343/2018; Notice no. 12344/2018)
- o National Institute of Agricultural and Veterinary Research (Notice no. 15851/2018)
- o Faculty of Social and Human Sciences of the University of Lisbon (Notice no. 11949/2021)
- o Faculty of Medicine of the University of Lisbon (Notice no. 5847/2022)
- o ARDITI - Regional Agency for the Development of Research, Technology and Innovation (Notice no. 20438/2022)
- o University of Coimbra (Notice no. 15742/2023)

5.3 Have there been any initiatives in your country to recognize and reward open science practices or are they foreseen by the end of 2025? *(ref.:* **(v) 20.a, 20.b, 20.c, 20.e, 20.f, 20.g, 20h***)*

No, Under development. Please refer to 5.2. With the anticipated approval of new open science policies, it is expected that new initiatives to recognize and reward open science practices will be implemented in Portugal by the end of 2025.

5.4 Have there been any unintended negative consequences[xi] of open science practices reported in your country? (ref.: (v) 20)

No.

6. PROMOTING INNOVATIVE APPROACHES FOR OPEN SCIENCE AT DIFFERENT STAGES OF THE SCIENTIFIC PROCESS

6.1 Have there been any initiatives at the national or institutional level that promote innovative, participatory methodological or procedural changes at different stages of the research cycle to increase the openness of the entire scientific process? *(ref.:* **(vi) 21***)*

Yes, at both national and institutional levels.

- **Plan S** – please refer to 1.4 and 2.4
- **New models of scientific communication** – please refer to 2.4
- **CoARA National Chapter: Portugal** – please refer to 5.1

- TREASURE project – please refer to 5.1
- **PNCADAI | Infrastructures and Services** – please refer to 2.4, 2.6 and 4.3
- **Scientific Electronic Library Online (Scielo)** – please refer to 3.4
- **Pub In –** please refer to 3.4

7. PROMOTING INTERNATIONAL AND MULTI-STAKEHOLDER COOPERATION IN THE CONTEXT OF OPEN SCIENCE AND WITH VIEW TO REDUCING DIGITAL, TECHNOLOGICAL AND KNOWLEDGE GAPS

7.1 **How is your country promoting and facilitating international scientific collaborations on open science as outlined in the 2021 Recommendation on Open Science?** *(ref.:* **(vii) 22.a***)*

- **OA2020 initiative:** Portugal is one of the signatories of the Open Access 2020, which promotes, supports and facilitates the practice of Open Science by the national community. FCT has promoted and facilitated international scientific collaboration by participating in the Berlin OA Conference in 2023 and has reaffirmed its commitment to OA by supporting digital services in open science, such as b-on, RCAAP and PUB IN, and in open data, such as POLEN.

- **Science Europe:** Portugal, through FCT, adheres to Science Europe's principles and recommendations to advance open science and open research data management practices. As an example, POLEN has developed a Data Management Plan template inspired by the Science Europe DMP template and the Practical Guide to the International Alignment of RDM, ensuring consistency and alignment with best practices.

- **cOAlition S:** The FCT is one of the 20 funding agencies represented in cOAlition S and has been implementing Plan S, allowing FCT to engage with international stakeholders, draw from the experiences of other participants, and collaborate on joint efforts and reflections. These interactions help maximize the effectiveness of implementing Plan S and advancing open science on a global scale.

- **European Open Science Cloud (EOSC):** FCT plays representation functions and acts as the national contact point for the EOSC. FCT aggregates information from EOSC-A and the European Commission to support the national research community, contributes to implementing EOSC's partnership, and coordinates the evaluation of existing resources within national structures and networks. Additionally, FCT supports the execution and monitoring of relevant activities, fostering alignment with international open science efforts and strengthening collaborative networks.

- **FAIRsharing Program:** FCT participated in this programme that aims to enhance the efficiency of research data policies, enable the alignment and comparison of policies, and improve guidelines for researchers in managing and sharing research data and other digital objects. https://fairsharing.org/

- **Brazil Collaboration:** This partnership fosters collaboration between institutions, knowledge sharing, and public engagement in science, supporting open science principles and strengthening ties between the two countries.

- **Mozambique Collaboration:** The FCT and Mozambique's National Research Fund (FNI) have signed, in 2016, a protocol of cooperation between the two countries in the fields of science, technology, and innovation. This collaboration seeks to foster growth and competitiveness in

the national economies of both nations by promoting joint initiatives based on equality and mutual benefit. The MoU will be implemented through various forms of cooperation between the two institutions. These include the exchange of personnel, scientists, researchers, and experts to support the development of science, technology, and innovation in both countries. It also entails the sharing of scientific and technological information, as well as teaching and learning materials resulting from collaborative efforts. https://www.fct.pt/media/noticias/fct-e-o-fundo-nacional-de-investigacao-de-   mocambique-assinaram-memorando-de-entendimento/

- **CPLP Collaboration:** FCT, together with the University of Minho and IBICT (Brazilian Institute of Information in Science and Technology), is the main implementer of a project aimed at creating the CPLP Scientific Repository (https://rc.cplp.org/). The creation of this central node for aggregating and connecting national scientific repositories from each Member State is expected to boost the scientific and technological capacity building of human resources with the skills needed to ensure the management of access to and sharing of scientific knowledge produced in CPLP Member States. The project also includes a strong component of capacity building and dissemination of best practices in Open Science and Science Management. https://esct.cplp.org/repositorio-cientifico/

7.2   **Does your country have a strategy or a plan for stimulating cross-border multi-stakeholder collaboration on open science, including with regards to exchange of best practices, capacity building and metrics for open science?** *(ref.:* **(vii) 22.b, 22.e, 22.f***)*

Portugal's strategy for stimulating cross-border multistakeholder collaborations relies on building on its existing partnerships, such as those with Brazil and European initiatives like the EOSC. The country aims to promote institutional participation in international working groups, while continuously seeking new opportunities to foster international cooperation. This strategy aims to further integrate Portugal into the global open science ecosystem, enhancing collaboration and knowledge exchange on an international scale.

7.3   **Is your country involved in any discussion on the establishment of regional and international funding mechanisms for open science? (ref.: https://unesdoc.unesco.org/ark:/48223/pf0000379949/PDF/379949eng.pdf.multi.nameddest=20/p.nameddest=20/.page=21)**

- **PNCADAI | RDM Competence Centers**

   As part of the National Programme for Open Science and Open Research Data (PNCADAI), 14 Research Data Management Competence Centers are being established within various entities across the national science and technology system. These centers aim to foster partnerships that drive open innovation. Geographically distributed throughout the country, they are designed to serve their regional communities by advancing research data management and open access. Their focus includes promoting FAIR principles, ensuring effective data curation, and building capacity among internal users.

- **Citizen Science activities**

   As part of FCT's participation in the OECD-GSF Citizen Science Expert Group, discussions are underway to explore new funding mechanisms for Citizen Science activities. These mechanisms aim to provide some form of recognition or reward for citizen scientists while preserving the voluntary nature that is fundamental to Citizen Science initiatives.

At the national level, municipalities have been key drivers of Citizen Science funding, as these activities often have the greatest impact at the local level. To build on this, new co-funding collaborations between FCT and municipalities are being analyzed, with the aim of strengthening support for these initiatives.

The goal is to incorporate these new funding mechanisms into national procedures and legislation, ensuring a structured and sustainable framework for supporting Citizen Science in Portugal.

8. GENERAL CONSIDERATIONS

8.1 Are there any specific external causes that may impede the implementation of the 2021 UNESCO Recommendation on Open Science in your country?

No. At a national level, several institutions and R&D units have been playing an active role in promoting the practice and principles of Open Science in general, particularly the 2021 UNESCO Recommendation on Open Science.

It is considered crucial that awareness-raising activities and initiatives take place on an ongoing basis, for greater involvement and engagement of the scientific community and society in general.

9. NOTES

[i] Please refer to the elements of open science defined in the 2021 Recommendation, namely: open scientific knowledge (including open access to scientific publications, research data, open educational resources, open-source software and code, open hardware), open science infrastructures, open engagement of societal actors and open dialogue with other knowledge systems.

[ii] The 2021 Recommendation outlines a set of shared values of open science stemming from the rights-based, ethical, epistemological, economic, legal, political, social, multi-stakeholder and technological implications of opening science to society and broadening the principles of openness to the whole cycle of scientific research. It also provides a set of guiding principles, as a framework for enabling conditions and practices, which uphold the values of open science and can realize the ideals of open science.

Please see the values of open science, namely quality and integrity, collective benefit, equity and fairness, and diversity and inclusiveness.

Please see the guiding principles for open science ,namely transparency, scrutiny, critique and reproducibility; equality of opportunities; responsibility, respect and accountability; collaboration, participation and inclusion; flexibility and sustainability.

[iii] National STI policy is most commonly a governmental document developed by governing bodies leading the STI policy design and implementation in a given country, which formulates objectives and guides actions and decision-making processes in the area of STI on the national level.

[iv] These can include specific national policies, sets of guidelines, rules, regulations, laws, principles, or directions to govern open science practices.

[v] Policy instruments include programmes, methods and mechanisms of technical and operational nature, required to solve the issues set by the policy, with focus on the target beneficiaries, resources, indicators, and set of goals for delivering products (short term), results (medium-term), and impacts (long term).

[vi] A funding mechanism refers to a policy instrument or process through which financial resources are allocated or provided for a specific purpose. Some examples are block funding, research grants, support for technological poles and centres of excellence, support for science parks and innovation centres, Infrastructure grants (for research facilities, labs, instruments), communication and outreach funds, innovation funds, loans and tax credits scholarships, studentships, fellowships, trust funds, sectoral funds.

[vii] Examples can include sharing open scientific knowledge (publications, research data, educational resources, software and hardware) with other scientists and with the public, sharing or using open infrastructures, collaboration with other researchers, with national and local societal actors such as policy makers, or sectors such as industry, agriculture, and health, and collaboration and open dialogue with indigenous peoples and local communities.

[viii] A national research and education network (NREN) is a specialised internet service provider dedicated to supporting the needs of the research and education communities within a country.

[ix] Some examples of open science infrastructures include major shared scientific equipment or sets of instruments, open computational and data manipulation service infrastructures that enable collaborative and multidisciplinary data analysis, open science platforms and repositories for publications, research data and source codes, archives, open bibliometrics and scientometrics systems for assessing and analysing scientific domains, open laboratories, software forges and virtual research environments, open innovation testbeds, incubators, science museums, science parks and infrastructure for non-digital materials.

[x] Open Educational Resources are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others (2019 Recommendation on Open Educational Resources)

[xi] For example, predatory behaviours, data migration, exploitation and privatization of research data, increased costs for scientists and high article processing charges associated with certain business models in scientific publishing that may be causes of inequality for the scientific communities around the world and, in some cases, the loss of intellectual property and knowledge.