

U.S. Department of Energy

# Public Access Plan

‘Ensuring Free, Immediate and Equitable Access’ to the Results of Department of Energy Scientific Research



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## Introduction/Background

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This document, the Public Access Plan (the Plan) for the Department of Energy (DOE or Department), including the National Nuclear Security Administration, presents the Department of Energy’s plan for increasing access to the results of the research and development (R&D) it supports in response to the August 25, 2022, Office of Science and Technology Policy (OSTP) Memorandum, “Ensuring Free, Immediate, and Equitable Access to Federally Funded Research”<sup>1</sup> and to the previous February 22, 2013, OSTP Memorandum, “Increasing Access to the Results of Federally Funded Scientific Research.”<sup>2</sup> This Plan, which supplants the Department’s July 2014 Public Access Plan, was developed by DOE’s Office of Science and Office of Scientific and Technical Information (OSTI), with input from across DOE. The Plan outlines the Department’s approach to implementing the objectives of the OSTP memoranda. Through policies and systems discussed in this Plan, scholarly publications, datasets, and associated metadata resulting from research directly arising from DOE funding will become readily and immediately accessible to the public. This sets the stage for increased innovation, commercial opportunities, and accelerated scientific breakthroughs, while maximizing equitable delivery of Federally funded research results and ensuring that transparent procedures maintain scientific and research integrity. Ensuring free, immediate, and equitable access to DOE-supported research will help achieve DOE’s mission to ensure America’s security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.

Following the key elements of OSTP’s August 25, 2022, memorandum, this Plan is comprised of three sections outlining how DOE will fulfill requirements for: 1) scientific publications, 2) scientific data, and 3) persistent identifiers (PIDs).

DOE will annually review the Plan, considering community feedback, technology changes, and operational improvements and will broadly communicate changes and revisions in requirements to the relevant communities.

## Authority

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This Plan was developed in response to the August 25, 2022, OSTP Memorandum, “Ensuring Free, Immediate, and Equitable Access to Federally Funded Research,” which builds upon the requirements of the February 22, 2013, OSTP Memorandum, “Increasing Access to the Results of Federally Funded Scientific Research.” The Plan is consistent with DOE’s current programs and policies for providing access to unclassified and otherwise unrestricted R&D results. These programs are based on existing DOE authorities, including but not limited to: the Atomic Energy Act of 1946, the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, the Department of Energy Organization Act of 1977, the Energy Policy Act of 2005, the America COMPETES Act of 2007, the America COMPETES Reauthorization Act of 2010, Department of Energy Acquisition Regulations and financial assistance regulations (48 Code of Federal Regulations [CFR] Chapter 9 and 2 CFR 910), and DOE Order 241.1B, Scientific and Technical Information Management, or its successor version.

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<sup>1</sup> <https://www.whitehouse.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-Access-Memo.pdf>

<sup>2</sup> [https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/ostp\\_public\\_access\\_memo\\_2013.pdf](https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf)

While the Plan seeks to maximize equitable, public, and free access to results of Federally funded research, it should be recognized that DOE statutes, regulations, and policies protect certain Federally funded research from public disclosure. For example, research results from financial assistance awards and Cooperative Research and Development Agreements may be protected from public disclosure for up to 30 years. Also, DOE research results that are unclassified may nevertheless be controlled information which, by law, may not be released to the public. DOE elements and contractors continuously seek to balance equitable public access to Federally funded research results with data protections provided by statute, regulations, and policies. Once finalized, the Plan will be published on the DOE website.<sup>3</sup> Additional resources for public access will be provided on the OSTI website<sup>4</sup> and by specific DOE sponsoring research offices on their websites.

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<sup>3</sup> <https://www.energy.gov/>

<sup>4</sup> <https://www.osti.gov/>



## Public Access to Scientific Publications

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DOE hosts and maintains an official designated public access repository, the DOE Public Access Gateway for Energy and Science (DOE PAGES),<sup>5</sup> for unclassified and otherwise unrestricted<sup>6</sup> scholarly publications resulting from DOE funding. DOE PAGES provides equitable public access to these scholarly publications, i.e., to the final, peer-reviewed accepted manuscripts (hereafter, accepted manuscripts or AM) or open access (OA) articles. The metadata and abstracts for such publications are open, readable, and available for bulk download. Metadata accompanying accepted manuscripts include author names, affiliations, sources of funding, journal title, date of publication, and the digital object identifier (DOI) for the article version of record. This ensures that attribution to authors, journals, and original publishers will be maintained along with proper acknowledgement of DOE as a funding agency. Upon receipt of the accepted manuscript at OSTI, DOE PAGES will make the full text of the accepted manuscript and the associated metadata freely and publicly accessible, without any embargo period. DOE PAGES will ensure that the public can read, download, and analyze accepted manuscripts in digital form. By ensuring public access and leveraging public access efforts of the community, DOE PAGES will maximize the potential for creative reuse of Federally funded R&D to enhance the value to the community, avoid unnecessary duplication of existing mechanisms, and maximize the impact of the Federal research investment.

### Scope and Applicability

The requirements of this public access policy apply to scholarly publications arising from activities undertaken with DOE funds, whether in whole or in part, unless otherwise prohibited by law, regulation, or policy. This includes scholarly publications produced by DOE Federal employees, contractors, and financial assistance recipients.<sup>7</sup> This Plan is subject to legal statutes; agency mission; budget and resource constraints; United States (U.S.) national, homeland, and economic security; and the objectives detailed in both OSTP Memoranda: “Ensuring Free, Immediate, and Equitable Access to Federally Funded Research” and “Increasing Access to the Results of Federally Funded Scientific Research.”

Consistent with the 2022 OSTP memorandum, “scholarly publications” always include the peer-reviewed research articles or final manuscripts published in scholarly journals, and may include peer-reviewed book chapters, editorials, and peer-reviewed conference proceedings published in other scholarly outlets that result from Federally funded research. Conference proceedings or papers that are subsequently published in a peer-reviewed journal are considered scholarly publications and are thus subject to the submission requirements stated in this Plan. Classified or controlled unclassified information (CUI)/data and research will not be made publicly available.

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<sup>5</sup> <https://www.osti.gov/pages/>

<sup>6</sup> In this document, “unclassified and otherwise unrestricted” refers generally to information that is identified as not exempt from disclosure under one or more of the exemptions to the Freedom of Information Act (FOIA), which includes Export Control, proprietary information, controlled unclassified information (CUI), protected data, and National Security classified information.

<sup>7</sup> Contractors include Management and Operating (M&O) contractors, National Laboratory contractors, and other contractor entities.

## Requirements

For each scholarly publication, the DOE Federal employees, financial assistance recipients, or contractors must submit the full-text accepted manuscript, including conference proceedings or papers published in peer-reviewed journals, and the associated metadata for the publication to DOE no later than the publication date of the article. If the article is published as OA, the submitter may provide metadata and either the accepted manuscript, the OA article, or a link to the OA article on the publisher's website or author's institutional repository, provided there are no restrictions on DOE ingesting the OA article. DOE will permanently retain accepted manuscripts and any ingested OA articles in DOE PAGES for archival and preservation purposes.

In addition to the requirement for submission of accepted manuscripts and associated metadata, authors must include a statement acknowledging DOE as a funding agency, along with the award number or contract number, in the full text of the publication.

## Roles and Responsibilities

DOE is responsible for communicating public access requirements to Federal employees, contractors, and financial assistance recipients. DOE will ensure that the appropriate requirements for public access described in this Plan are included in contracts and financial assistance awards. The submission of accepted manuscripts and associated metadata will be a condition of continued funding consistent with the terms and conditions of the award or contract. The Department will ensure compliance through mechanisms already in place for reporting and closeout of awards.

Federal employees, contractors, and financial assistance recipients will be responsible for providing the full text of the accepted manuscript and metadata to OSTI through established DOE scientific and technical information (STI) ingest systems.

OSTI is responsible for operating and maintaining DOE's designated public access repository, DOE PAGES, along with the corporate STI ingest system, E-Link.<sup>8</sup> OSTI is responsible for making the scholarly publications and associated metadata publicly available. OSTI will work with the STI Managers at DOE National Laboratories, and with procurement officials for awards, to acquire any missing accepted manuscripts and metadata.

## Planning and Implementation

### *Submitting publications and associated metadata to OSTI*

To ensure long-term preservation and access, all Federal employees, contractors, and financial assistance recipients are required to submit the full text of accepted manuscripts and associated metadata to OSTI using E-Link. To implement immediate access to scholarly publications, DOE encourages use of the Green Open Access model, whereby the Federal employee, contractor, and financial assistance recipient submits the accepted manuscript to OSTI. Researchers may choose to publish their articles as "Open Access," as DOE does not prohibit reasonable OA fees as an allowable cost. DOE will monitor publisher costs/fees and will determine if additional guidance is needed on "reasonable" publication costs. In the case of OA articles, the author has the

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<sup>8</sup> <https://www.osti.gov/elink/>

option of providing DOE the full text of the accepted manuscript, the article itself, or a link to the OA article on the publisher's website or in the author's institutional repository, provided there are no restrictions or barriers on DOE ingesting the OA article into DOE PAGES. The metadata describing the article should include the DOI, which will link to the publisher's version of record article.

DOE will explore opportunities to provide access to machine-readable formats of publications to support data initiatives (including artificial intelligence [AI] training), including post-submission conversion from other formats and ingest of native machine-readable formats submitted by DOE-funded authors.

### ***Accessing, using, and reusing publications resulting from DOE funding***

DOE PAGES, hosted and maintained by OSTI, is the Department's official designated repository for publications resulting from DOE funding. After submission to OSTI, DOE PAGES will provide access to the publication record without delay. The record will include the full text of the accepted manuscript and associated metadata, thus providing immediate, equitable, and free access to the public. Publication records in DOE PAGES will also include the DOI, linking to the published version of the article, which may also be publicly available. DOE will explore having DOE PAGES make publication records available via open specifications for machine-readable formats.

DOE PAGES supports machine-to-machine access to publications and metadata through an OSTI application programming interface (API). OSTI provides APIs with defined terms of service to allow third party use of the information it provides. DOE PAGES provides metadata within the publication record for citation in widely used formats such as MLA, APA, Chicago, and BibTeX. Additionally, DOE PAGES supports export of metadata citations in CSV/Excel, XML, JSON, and RIS formats. The metadata contained in DOE PAGES is in the public domain and available for unlimited use and re-use.

DOE PAGES complies with existing accessibility regulations and OSTP and Office of Management and Budget (OMB) guidance. The DOE PAGES user interface maximizes equitable access, including device-size responsiveness and support and implementation of Section 508 of the Rehabilitation Act (29 U.S.C § 794 (d)). OSTI uses a suite of tools and techniques to enable compliance with Section 508 and will explore expressing extracted machine-readable text in both XML and JSON, which are industry standards for accessibility device readability. OSTI will also explore supporting access points to the machine-readable full text.

For peer-reviewed accepted manuscripts, DOE's government license allows DOE to distribute copies of accepted manuscripts to the public. DOE's government license is reserved *ab initio* by the terms and conditions of the relevant contract or agreement and takes precedence over a subsequent transfer of copyright by the DOE contractor or financial assistance recipient.<sup>9</sup> Therefore, DOE-funded authors will not be in violation of any copyright by submitting such accepted manuscripts and metadata to OSTI. However, publishers' copyright transfer agreements and journal publication agreements may include language about withholding any distribution of the manuscript for a period of time (e.g., a 12-month embargo period). To

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<sup>9</sup> Guidance on Public Access Policy by Assistant General Counsel for Technology Transfer and Intellectual Property, dated April 16, 2015.

avoid any misunderstanding, contractors and financial assistance recipients who sign such agreements should ensure the agreements do not include an embargo period; however, as stated above, the government license takes precedence over any subsequent transfer of copyright.

In making the accepted manuscript publicly available to fulfill DOE's public access commitment, it is not necessary to pay "author pays"/ "Gold OA" fees or article processing charges to enable public access to their research. The government license for accepted manuscripts allows DOE to make the accepted manuscripts publicly accessible immediately, and to make them freely available to read, download, and analyze.

A member of the public who obtains a copyrighted, accepted manuscript from DOE may use and re-use the manuscript in accordance with U.S. copyright law but does not have the right to reproduce, make derivative works, further distribute, or publicly display or perform the work. Since DOE's government license is for government purposes only, DOE cannot transfer any of its rights to the public. Rather, a person who obtains a copyrighted, accepted manuscript from DOE may read, download, and analyze the manuscript and may utilize the manuscript in accordance with recognized legal constructs.

A person who obtains a copyrighted, accepted manuscript from DOE is restricted from practicing the rights afforded to DOE under its government license, since those rights are for government purposes only. As such, DOE is not able to sublicense its rights to the public in a copyrighted, accepted manuscript.

Providing attribution to the author(s) of copyrighted works is fairly common. Often, the terms and conditions of a copyright license or assignment requires attribution. For example, the Creative Commons BY (CC BY) license requires licensees to give attribution to the author(s). The CC BY license also permits licensees to reproduce and make derivative works. However, since the government's license is for government purposes only, DOE is not able to transfer its rights to the public in copyrighted, accepted manuscripts. Consequently, DOE cannot itself apply the CC BY license, or any other license, to copyrighted, accepted manuscripts. Nevertheless, DOE, within OSTI search tools such as DOE PAGES, requests that users appropriately acknowledge use of those research results.

DOE will leverage public access efforts of the publishing community and others in order to maximize the potential for creative reuse of Federally funded R&D, avoid unnecessary duplication of existing mechanisms, and maximize the impact of the Federal research investment. DOE will seek to maximize re-use rights to scholarly publications under existing copyright law and "rights in data" clauses for DOE regulations; however, re-use rights are restricted due to the Government's license and are not a mandatory element of DOE's Plan.

### **Metrics, Compliance, and Evaluation**

DOE will use various bibliometric and citation sources, mining Acknowledgement and Affiliation fields, to identify any gaps in DOE PAGES metadata and accepted manuscript submissions. Comparison of the known corpus of publications resulting from DOE funding to the actual receipts in DOE PAGES will identify specific gaps. OSTI will work with the STI Managers at DOE National Laboratories, and with procurement officials for awards, to acquire any missing accepted manuscripts and metadata. While not a substitute for DOE-funded

author submissions of accepted manuscripts, DOE will explore using internal and third-party services to augment its collections. Various compliance mechanisms and incentives, such as inclusion of public access requirements and milestones in DOE Laboratory Performance and Evaluation Measurement Plans, will continue to be employed. For financial assistance recipients, the terms and conditions of the award specify reporting requirements that must be met prior to award closeout. Reporting requirements are also included in DOE contracts. A statement acknowledging DOE as a funding agency, along with the associated award number or contract number, should be included in the full text of the publication. This acknowledgment will be used to assess and measure compliance with public access requirements.

Upon request from OSTP, DOE will provide status reports on its public access plan and policy implementation, including metrics on the number of publications produced, number of accepted manuscripts submitted to DOE, and other relevant statistics.

### **Community Engagement**

The community includes Federally funded researchers and universities, libraries, publishers, professional societies, users of Federally funded research, and civil society groups. DOE will continue to solicit the views and input of community members and will use multiple channels for such feedback. Comments on this Plan may be submitted to [comments@osti.gov](mailto:comments@osti.gov).

DOE will coordinate with other Federal agencies through the National Science and Technology Council Subcommittee on Open Science on topics related to public access to publications.

### **Public Notice**

The requirements in the Plan are consistent with existing Departmental policies and regulations; however, as noted under Community Engagement, DOE will broadly communicate the Plan to affected communities and provide ongoing channels for community input.

### **Timeline for Implementation**

Upon OSTP approval of the Plan, DOE will communicate new requirements to its research communities and DOE Scientific and Technical Information Program representatives. As required by the 2022 OSTP memo, DOE will complete and publish full policy development for implementing this Plan by December 31, 2024, with an effective date within 12 months after publication of the Plan. OSTI will work with the DOE National Laboratories, and with financial recipients, on strategies for submitting accepted manuscripts immediately upon confirmation of publication. In consultation with DOE sponsoring research offices, and DOE research contractors and financial assistance recipients, implementation timelines will be developed for achieving “full compliance” regarding immediate submission of accepted manuscripts.

### **Resources**

DOE will use existing OSTI and DOE resources to operate DOE PAGES and to facilitate submission of accepted manuscripts by DOE researchers. Implementation of some aspects of the Plan, including conversion of submitted document formats into machine-readable formats, are contingent on availability of resources. DOE

will allow researchers to include reasonable publication and associated costs as allowable expenses in all research budgets.



## Public Access to Scientific Data in Digital Formats

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The Department affirms that the following principles for the management of digital scientific research data support its mission and align with the objectives of the OSTP memo.

- Effective data management and sharing has the potential to increase the pace of scientific discovery, promote more efficient and effective use of government funding and resources, and create a more equitable Federal scientific ecosystem through data sharing and preservation. Data management planning should be an integral part of research planning.
- Sharing and preserving data are central to protecting the integrity of science by facilitating validation and replication of results and to advancing science by broadening the value of research data to disciplines other than the originating one and to society at large. To the greatest extent, with the fewest constraints possible, in a timely and equitable manner, and consistent with the requirements and other principles stated in this Plan, data sharing should make digital research data available to and useful for the scientific community, industry, and the public.
- Data management planning should maximize appropriate<sup>10</sup> sharing of scientific data while preserving the balance between the relative value of long-term preservation and access and the associated cost and administrative burden.

DOE leads by example through its broad support of increased open access to publicly accessible energy data as fuel for innovation. DOE currently supports a number of publicly accessible repositories of research data and, with input from public, private, and academic communities, is active in developing new repositories to meet mission goals. This practice will continue as resources are developed for data sharing and preservation. Guided by the FAIR (Findable, Accessible, Interoperable, and Reusable) Data Principles<sup>11</sup> and other best practices in scientific data management, DOE will work to improve access to all publicly accessible DOE-funded data across private and public sectors.

To provide access to public data with the necessary flexibility to support the diverse R&D community funded by the Department, a Data Management and Sharing Plan (DMSP) will define the relevant details for the management and public sharing of scientific data by the recipient of a funded research and development effort. A DMSP may include, but is not limited to, what data will be publicly shared, the data or metadata standards that will be used, any related tools, software, or code, how data will be shared and preserved, and any necessary data protections. While a DMSP is created by a funding applicant or recipient and is specific to their scope of work, it will be reviewed and may be updated, if

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<sup>10</sup> The term “appropriate” is used to signal that public access to federally funded research results and data should be maximized in a manner that protects confidentiality, privacy, business confidential information, and security, avoids negative impact on intellectual property rights, innovation, program and operational improvements, and U.S. competitiveness, and preserves the balance between the relative value of long-term preservation and access and the associated cost and administrative burden.

<sup>11</sup> “The FAIR Guiding Principles for scientific data management and stewardship” (<https://doi.org/10.1038/sdata.2016.18>). The FAIR Data Principles were proposed and endorsed in 2016 by an international collaboration of universities, industry, funding agencies, and scholarly publishers.

and when appropriate, to maintain strategic DOE program alignment, respond to reviewer feedback, and/or to reflect the progress of the supported research.

The DOE Policy for Digital Research Data Management,<sup>12</sup> developed after the approval of the 2014 DOE Public Access Plan, ensures that DOE-funded research activities have an associated Data Management Plan (DMP). Since 2015, sponsoring research offices have ensured that the requirements for DMPs are included in all solicitations and invitations for research funding with details about how and when a DMP should be submitted.

Guidance, including suggested elements for a DMP, and additional information about data management resources at DOE scientific user facilities are provided on DOE public webpages. Some sponsoring research offices provide additional requirements and guidance specific to their programs, providing updates and revisions as appropriate. For example, in 2021, the Office of Science updated its guidance regarding suggested elements for a DMP and provided additional guidance for reviewers on digital data management.<sup>13</sup>

DOE and individual DOE programs and elements will continue to revise and update policies and guidance provided for the management of digital research data to reflect the latest DOE Public Access Plan and best practices in data management.

In instances where the Department intends to collect digital data resulting from the supported research, requirements for data deliverables may be necessary to ensure the Department meets the requirements of the OPEN Government Data Act.<sup>14</sup> For elements of the Department for which the collection of researcher data is not already practiced, DOE will consult with its research communities through public forums such as Federal advisory committee meetings and public announcements to identify which, if any, research data are appropriate for DOE collection and inclusion in the public listing of agency data required by the Open Data Policy, and suitable mechanisms for doing so.

## Scope and Applicability

The requirements of this public access policy apply to unclassified and otherwise unrestricted digital scientific data arising from research and development activities undertaken with DOE funds, whether in whole or in part, unless otherwise prohibited by law, regulation, or policy. This includes scientific data produced by Federal employees, contractors, and financial assistance recipients where the data are unclassified and otherwise unrestricted. This Plan is subject to legal statutes; agency mission; budget and resource constraints; U.S. national, homeland, and economic security; and the objectives detailed in both OSTP Memoranda: “Ensuring Free, Immediate, and Equitable Access to Federally Funded Research” and “Increasing Access to the Results of Federally Funded Scientific Research.”

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<sup>12</sup> <https://www.energy.gov/datamanagement/doe-policy-digital-research-data-management>

<sup>13</sup> <https://science.osti.gov/Funding-Opportunities/Digital-Data-Management>

<sup>14</sup> The “OPEN Government Data Act” is part of the “Foundations for Evidence-Based Policymaking Act of 2018” (<https://www.congress.gov/bill/115th-congress/house-bill/4174>).



For the purposes of this Plan, “scientific data” include the recorded factual material commonly accepted in the scientific community as of sufficient quality to validate and replicate research findings. Such scientific data do not include laboratory notebooks, preliminary analyses, case report forms, drafts of scientific papers, plans for future research, peer-reviews, communications with colleagues, or physical objects and materials, such as laboratory specimens, artifacts, or field notes. The definition of “scientific data” is similar to but broader than the term “research data” defined by 2 CFR 200.315 (e) and 45 CFR 75.322 (e). Classified or CUI data and research will not be made publicly available.

## Requirements

To integrate data management planning into the overall research plan, the Department will ensure that all DOE-funded research and development awards and contracts are subject to a DOE approved DMSP. The DMSP will address validation and replication of results, timely and equitable access, data repository selection, data management resources, and data sharing limitations. Proposals may include the cost of implementing the DMSP in the proposed budget.

### *Data Management and Sharing Plan requirements*

#### **1. Validation and replication of results**

The DMSP should describe how data generated in the course of the research project will be publicly shared and preserved in a timely and equitable manner that enables validation and replication of results. If data will not be publicly shared and preserved (see requirement 5), the DMSP should describe how results could be validated and replicated.

#### **2. Timely and equitable access**

The DMSP should provide a plan for making all scientific data displayed in peer-reviewed scholarly publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital scientific data used to generate peer-reviewed scholarly publications should be made freely available and publicly accessible at the time of publication, in accordance with the principles stated above. The published article should indicate how these data can be accessed. The DMSP should also provide a timeline for sharing digital scientific data produced under the DOE funded R&D effort not associated with peer-reviewed scholarly publications.

#### **3. Data repository selection**

The DMSP should specify the use of digital repositories that align, to the extent practicable, with the National Science and Technology Council document entitled “Desirable Characteristics of Data Repositories for Federally Funded Research.”<sup>15</sup> In general, DOE does not endorse or

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<sup>15</sup> “Desirable Characteristics of Data Repositories for Federally Funded Research,” Guidance by the Subcommittee on Open Science of the National Science and Technology Council, May 2022 (<https://www.whitehouse.gov/wp-content/uploads/2022/05/05-2022-Desirable-Characteristics-of-Data-Repositories.pdf>).

require sharing in any specific repository and encourages researchers to select the repository that is most appropriate for their data type and discipline, though individual sponsoring research offices may provide specific guidance or designate a specific repository.

#### **4. Data management and sharing resources**

The DMSP should describe the data management and sharing resources that may be available and used in the course of the proposed research. In particular, a DMSP that explicitly or implicitly commit data management and sharing resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management and sharing at DOE scientific user facilities,<sup>16</sup> researchers should consult the published description of data management resources and practices at that facility and reference it in the DMSP.

#### **5. Data sharing limitations**

The DMSP should address any limitations of data sharing to facilitate the protection of confidentiality, privacy, business confidential information, and/or security; avoid negative impact on intellectual property rights, innovation, program and operational improvements, and U.S. competitiveness; consider maximizing appropriate sharing through risk-mitigated limited access; preserve the balance between the relative value of long-term preservation and access and the associated cost and administrative burden; and otherwise be consistent with all applicable laws, regulations, and DOE orders and policies. Depending on the DOE funding agreement, a contractor or financial award recipient may have the right to assert copyright to or protect from public release for certain scientific data. When contractors or award recipients assert copyright of scientific data, the DMSP should address licensing requirements and any limitations for sharing the copyrighted data. When contractors or award recipients assert data protection, the scientific data will not be shared with the public during the data protection period.

The DOE sponsoring research office or element may modify or add to the requirements above for Data Management and Sharing Plans for any program or project. Any such changes should be identified in the applicable solicitation or invitation for research funding for the projects impacted by the changes.

### **Roles and Responsibilities**

The DOE sponsoring research office or element is responsible for including the DMSP requirements into all solicitations and invitations for research funding, including whether DMSPs will be part of the research proposal and merit review process or negotiated during award negotiations, as well as whether DMSP formats or sample plans will be made available.

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<sup>16</sup> A DOE Office of Science user facility is a Federally sponsored research facility available for external use to advance scientific or technical knowledge under the conditions defined in: [https://science.osti.gov/-/media/ /pdf/user-facilities/memoranda/Office\\_of\\_Science\\_User\\_Facility\\_Definition\\_Memo.pdf](https://science.osti.gov/-/media/ /pdf/user-facilities/memoranda/Office_of_Science_User_Facility_Definition_Memo.pdf)



DOE is responsible for initiating activities to review the effectiveness of the requirements, including compliance with DMSPs, and making any improvements to the existing requirements and accompanying documentation.

Researchers are responsible for proposing or agreeing to an appropriate DMSP, and adhering to the final, agreed DMSP as part of the overall research activity. Researchers should propose DMSPs that reflect relevant standards and community best practices for data and metadata and make use of community-accepted repositories and publicly accessible databases whenever practicable.

When DMSPs are part of the merit review process, members of the research community serving as reviewers of research proposals are responsible for reviewing the DMSP as part of the scientific and technical merit of those proposals.

## **Planning and Implementation**

The Department will include its DMSP requirements in all Funding Opportunity Announcements and Laboratory Announcements and other invitations for research funding. Direct and indirect costs associated with the DMSP may be included in the proposed budget. When required to be a part of a proposal, proposals submitted without a DMSP may be rejected without further review.

The DMSP, as an integral part of any research project, will be appropriately reviewed. A DMSP may be reviewed as part of a proposal, with reviewer comments considered during the selection process and comments on the DMSP added to the selection statement for funding. A DMSP may be reviewed during the award negotiation process, after selection but before project implementation. A DMSP may be reviewed when evaluating DOE laboratory research activities as a part of the well-established periodic performance review process.

The DMSP will become part of the financial assistance award or contract for the research project, as such, it is expected that researchers will follow, to the best of their ability, the plan set forth in the DMSP.

Researchers will be expected to report progress on implementation of their DMSP through regular reporting processes, including providing information about publicly available scientific data as research products in Research Performance Progress Reports (RPPRs) and to OSTI as STI, as appropriate. Through regular reporting mechanisms, researchers will also be expected to provide any updates necessary to the DMSP as the research activity progresses.

DOE National Laboratories are required to report scientific datasets to OSTI as STI unless those datasets include classified, protected, or other categories of information that are not subject to public release. Reporting data as STI ensures proper announcement of DOE-supported data and that publicly accessible data has an associated DOI, consistent with the PID requirements below. As part of implementing this

plan, DOE will explore requiring financial assistance awardees to report publicly available scientific data records as research products in RPPRs and as scientific datasets to OSTI as STI.

The development of knowledge and skills necessary for effective management, analysis, storage, preservation, and stewardship of scientific data are integrally tied to the training and education of students and professionals within the scientific and technical disciplines in which the scientific data are being produced. The Department supports ongoing efforts within its research programs to train researchers, undergraduates, graduate students, and postdocs in the scientific and technical areas aligned with the Department's mission areas and, as part of those efforts, supports training in the best practices in scientific data management, sharing, and analysis.

## **Metrics, Compliance, and Evaluation**

### ***Metrics and evaluation***

It is envisioned that the long-term needs for data sharing will be assessed on a regular basis by individual sponsoring research offices. This will provide a venue for evaluating the impact of the DMSP requirements on data sharing and preservation practices of the various research communities. Regular reporting of research products and STI, including scientific research data, will aid in this evaluation process.

OSTI provides DOIs to data resulting from DOE-funded research when data records are submitted to OSTI (unless a DOI has already been assigned). The use of DOIs as persistent identifiers and the metadata collected through STI reporting enable better tracking of metrics and evaluation of the impact of publicly available data funded through DOE research efforts.

### ***Compliance***

Reporting processes will include opportunities for researchers to provide information about the implementation status of and any updates to the DMSP. Current oversight of financial assistance allows for withholding or adjustment of funds at the end of each performance period if DMSPs are not appropriately followed. Failure to appropriately follow the DMSP may negatively influence future opportunities to receive DOE funding.

## **Community Engagement**

DOE welcomes and will continue to solicit ongoing community input and feedback through multiple channels, including Federal advisory committees, meetings, and workshops, to assess the impact of the DMSP requirements and ensure compliance with accepted DMSPs. Comments on this Plan may be submitted to [comments@osti.gov](mailto:comments@osti.gov).

DOE will coordinate with other Federal agencies through the National Science and Technology Council Subcommittee on Open Science on topics related to the management of scientific research data.

## **Public Notice**

These requirements are consistent with existing Departmental policies and regulations; however, as noted under Community Engagement, DOE will broadly communicate the Plan to affected communities and provide ongoing channels for community input.

### **Timeline for Implementation**

The existing Department-wide policy for digital data management will be revised to reflect the new OSTP memo requirements by December 31, 2024. DOE sponsoring research offices and elements will implement the revised Department-wide Data Management and Sharing Plan requirements no later than December 31, 2025. Should it be necessary, additional supplementary guidance and requirements addressing specific needs will be issued by each sponsoring research office or element and coordinated centrally.

### **Resources**

Incremental funding for data management and sharing will be supported through commensurate budget for the approved data management scope.

## Using Persistent Identifiers to Ensure Scientific and Research Integrity

The Department supports the delivery of transparent, open, and free communication of DOE-funded R&D through the collection and use of research results metadata and PIDs as a tool to uphold scientific and research integrity. The use of PIDs will help DOE realize many associated benefits. PIDs reduce administrative burden, enable greater discovery, provide improved credit, increase access, improve trust, increase interoperability, and facilitate evaluation through interlinking research components. The approaches described in the Plan will ensure that DOE is clearly communicating critical information about its funded research results to the public and research communities. Specifically, DOE will provide direction for the use of PIDs and PID services to connect researchers, awards, organizations, and research results.

Implementing broad collection and use of PIDs for researchers will allow DOE to realize tremendous benefits. The benefits include enabling researcher disambiguation, burden reduction when requesting information from researchers, streamlined reporting mechanisms, enabling better analytics and impact assessment, and helping with information validation. The benefits to researchers of DOE collecting and using PIDs for individuals include burden reduction when providing information to DOE, enabling disambiguation of themselves, reuse of information associated with the identifier in various systems, enabling improved credit for their work, facilitating privacy control of information, and providing a digital curriculum vitae at no cost.

ORCID (Open Researcher and Contributor ID) iDs are a type of PID for individuals/researchers that meets the common/core standards of a digital persistent identifier service defined in the National Security Presidential Memo 33 (NSPM-33) Implementation Guidance.<sup>17</sup> ORCID<sup>18</sup> is a not-for-profit organization enabling transparent and trustworthy connections between researchers, their contributions, and affiliations by providing a PID (ORCID iDs) for individuals to use with their name as they engage in research, scholarship, and innovation activities.

DOE, through OSTI, leads the U.S. Government ORCID Consortium.<sup>19</sup> The consortium is a mechanism for U.S. government agencies, offices, Government-operated laboratories, Contractor-operated laboratories managed by a nonprofit, and government organizations to become ORCID members and use their services. Consortium members include DOE offices, National Laboratories, and facilities, as well as other Federal agencies.

DOE uses DOIs as a PID for research results through its STI processes,<sup>20</sup> both collecting DOIs when they are assigned by another source/organization and assigning DOIs to certain research results that do not already have an associated DOI. DOIs are provided through registration agencies of the International

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<sup>17</sup> <https://www.whitehouse.gov/wp-content/uploads/2022/01/010422-NSPM-33-Implementation-Guidance.pdf>

<sup>18</sup> <https://orcid.org/>

<sup>19</sup> <https://www.osti.gov/pids/orcid-services/us-gov-orcid-consortium>

<sup>20</sup> <https://www.osti.gov/pids/doi-services>

DOI Foundation,<sup>21</sup> such as Crossref<sup>22</sup> and DataCite.<sup>23</sup> DOIs meet the definition of persistent identifiers provided in the 2022 OSTP Public Access Memo. The benefits for DOE of collecting and assigning DOIs include increased discovery of DOE-funded research results, a standard approach for referencing DOE-funded research, facilitating linkages between research components, and enabling improved tracking and impact assessment. The benefits for researchers of DOE collecting and assigning DOIs include increased discovery of their research results, a standard approach for referencing their work which will enable appropriate credit, facilitating linkages between their research components, and burden reduction when reporting research results to DOE.

DOE, through OSTI, has been providing PID services since 2005. OSTI currently provides support for the collection of metadata, collection of PIDs, associating appropriate PIDs, and assignment of DOIs to research results and awards. Current DOE-funded researchers can provide or assign DOIs to research result records they submit to OSTI. Researchers can also currently provide ORCID iDs within the records they submit to OSTI. OSTI has been increasing its support for PIDs through the expansion and redevelopment of an internal authority that catalogs organizations' names, records, and reconciles PIDs for organizations. The organization authority has been used to standardize the organization names provided in research result records submitted to OSTI and will provide the ability for each organization in the OSTI metadata to have an associated PID.

## Scope and Applicability

This section applies to R&D awards, metadata and associated PIDs for publication and data records produced with complete or partial DOE funding, and to Federal employees, contractors, and financial assistance recipients. This section of the Plan also relates to the collection metadata associated with publication and data records (including PIDs as applicable) and to PIDs associated with senior/key personnel on DOE awards.

This Plan is subject to legal statutes; agency mission; budget and resource constraints; U.S. national, homeland, and economic security; and the objectives detailed in both OSTP Memoranda. Classified or controlled unclassified data and research will not be made publicly available.

Consistent with the 2022 OSTP memorandum, "persistent identifiers" refers to digital identifiers that are globally unique, persistent, machine resolvable and processable, with an associated metadata schema.

## Requirements

DOE will collect, assign, and/or include, and make publicly available, metadata and associated PIDs for publications and data records resulting from DOE funding. This will include PIDs associated with authors, sources of funding, organizations, and research results.

DOE will instruct DOE-funded researchers to obtain a PID for themselves that meets the common/core

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<sup>21</sup> <https://www.doi.org/>

<sup>22</sup> <https://www.crossref.org/>

<sup>23</sup> <https://datacite.org/>

standards defined in the NSPM-33 Implementation Guidance. DOE-funded researchers will be expected to provide their researcher PID in various DOE systems (e.g. application and reporting systems) and include it in the metadata describing their research results.

## **Roles and Responsibilities**

DOE is responsible for communicating the PID policies and expectations to all Federal employees, contractors, and financial assistance recipients. DOE will instruct researchers (senior/key personnel) to obtain a PID for themselves.

OSTI is responsible for collecting and making publicly available metadata associated with publication and data records, referencing PIDs as appropriate. OSTI will assign DOIs to certain research results that have not been assigned a DOI from an external source. OSTI will associate PIDs with organization metadata and include those organization PIDs within research result records and DOIs metadata.

DOE-funded researchers are responsible for obtaining a PID for themselves. Funded researchers will be expected to provide their researcher PID in various DOE systems (e.g. application and reporting systems), including them in the metadata describing research results (e.g. providing to publishers when publishing journal articles and to data repositories where their data is hosted), and including them within the publication and data records submitted to OSTI. Funded researchers and/or organizations will need to provide any DOI associated with the publication or data record within the metadata submitted to OSTI.

## **Planning and Implementation**

OSTI has a long history of collecting and making publicly available DOE-funded research results and associated metadata through E-Link and OSTI search tools (e.g. OSTI.GOV and DOE PAGES). OSTI manages the collected metadata using best practices and community standards. OSTI collects metadata, including the fields required by the OSTP Memo, that are necessary for internal business practices and to ensure broad dissemination and discovery of DOE-funded R&D results. OSTI will continue to collect and make publicly available metadata associated with publication and data records referencing PIDs as appropriate through those mechanisms. The metadata made publicly available will include authors, affiliations, and sources of funding, referencing associated PIDs, as well as the date of publication and PIDs associated with the research result. The metadata made publicly available in OSTI search tools is in the public domain and available for unlimited use and re-use.

### ***Metadata and PIDs for publication and data records***

- OSTI will continue to provide guidance and collect publication and data records with associated metadata and PIDs through E-Link as required by DOE O 241.1B, or its successor version, DOE Federal Assistance Reporting Checklist DOE F 4600.2, and contract rights in data clauses.
- OSTI will continue to use E-Link to collect publication and data record metadata and make the records publicly available through OSTI search tools. Metadata will include authors, affiliations, sources of funding, the date of publication, PIDs associated with the research result, and other associated PIDs.



- As part of the E-Link submission process for publications and data records, the DOI associated with the research result is requested within the metadata.
- For publications, the DOI is assigned by the publisher. In cases where researchers do not have access to or know the publication DOI, OSTI will add the DOI to the record metadata during internal metadata curation processes.
- For data, a DOI may be assigned by the repository hosting the data and, in that case, should be provided within the metadata record submitted to OSTI. In cases where a data record does not have an associated DOI, OSTI will assign a DOI for the data record.
- The DOIs associated with publications and data records are currently available and will continue to be displayed within the record metadata discoverable in OSTI search tools.

#### *PIDs for people/researchers*

- DOE will instruct senior/key personnel (to the extent consistent with non-endorsement and procurement laws and policies) to have a researcher PID for themselves by time of award to be used throughout the research lifecycle to uniquely identify the individual (e.g. within grant applications, during progress reporting, and reporting research results).
- OSTI will continue to use E-Link to collect PIDs associated with authors within publication and data record metadata.
- OSTI provides guidance for obtaining and using researcher PIDs within E-Link and OSTI.GOV.
- When researcher PIDs are collected upstream within other DOE systems, OSTI, within E-Link, will work to collect and associate the PID with authors of publication and data records.
- Researcher PIDs will also be collected from other sources whenever possible (e.g. via Crossref, DataCite, from DOE National Laboratories, etc.) and be associated with authors of publication and data records within E-Link.
- The researcher PIDs associated with authors will continue to be displayed within the record metadata discoverable in OSTI search tools.

#### *PIDs for organizations*

- OSTI maintains an organization authority that includes all organization names (and organization name variations) that have been provided to OSTI within organization metadata (e.g. author affiliations, sponsoring organizations, and research organizations). The organization authority has been rebuilt and updated to associate PIDs with each organization.
- E-Link will be updated to use the new organization authority to support the association of PIDs with organization metadata.
- The organization metadata and PIDs will be displayed within the record metadata discoverable in OSTI search tools.

#### *PIDs for awards*

- DOE acknowledges Section 4.c. of the 2022 OSTP Public Access Memo instructing agencies to assign PIDs to all scientific research and development awards. DOE will update its Public Access Plan by December 31, 2024, with a plan to address this section.



## Metrics, Compliance, and Evaluation

OSTI has robust procedures in place to track the compliance of publication records submitted. OSTI will continue to use these practices to check compliance of the metadata and associated PIDs for publication records.

OSTI currently works with DOE laboratories, sponsoring research offices, and other DOE staff to identify data records that should be submitted to OSTI. OSTI will work across DOE to develop more robust procedures for identifying data records resulting from DOE funding and ensuring those records are submitted. This includes creating connections between sponsoring research office reporting systems and E-Link to streamline reporting and submission of publication and data records. These methods will be used to check compliance of the metadata and associated PIDs for data records.

When publication and data records are submitted to OSTI, OSTI will provide mechanisms for submitters to provide associated metadata and applicable PIDs. DOE will continue to evaluate compliance procedures working with both internal and external communities.

## Community Engagement

The development of existing OSTI PID services has been in consultation with many communities to ensure their needs are met and to help enable research integrity, tracking, and impact assessment. OSTI holds regular meetings and workshops to solicit input from both internal and external communities. Communities include DOE staff and contractors, other Federal agencies, Federally funded researchers and universities, libraries, publishers, and users of Federally funded research results.

DOE welcomes and will continue to solicit ongoing community input and feedback through multiple feedback channels, including meetings, workshops, and email ([comments@osti.gov](mailto:comments@osti.gov)). DOE will also continue to coordinate with other Federal agencies through the National Science and Technology Council Subcommittee on Open Science on topics related to PIDs.

DOE will take community feedback into account in revising and improving the PID services OSTI offers and DOE's implementation and integration of PIDs into DOE workflows.

## Public Notice

The requirements in the Plan for collecting PIDs associated with research result metadata are consistent with existing Departmental policies and regulations; however, as noted under Community Engagement, DOE will broadly communicate the Plan to affected communities and provide ongoing channels for community input.

DOE may provide flexibility for when senior/key personnel will be instructed to obtain PIDs for themselves. Public notice or rulemaking may be necessary depending on the method of instruction.

## Timeline for Implementation

OSTI collects the metadata associated with publication and data records and makes the metadata

publicly available within OSTI search tools and tools indexing DOE research result records.

The updates to E-Link will be released in 2024 and will include additional support for PIDs. Updates to E-Link for additional support of PIDs are currently in active development.

DOE will instruct senior/key personnel about requirements to obtain a PID for themselves by the end of 2024.

## **Resources**

OSTI will use existing resources to collect publication and data record metadata, associate PIDs within the metadata as appropriate, and provide PID services.