



U.S. DEPARTMENT
of **ENERGY**

Restoring Gold Standard Science DOE Implementation Plan: 2026 Annual Update

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**United States Department of Energy
Washington, DC 20585**

Executive Summary

The mission of the Department of Energy (DOE) is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. The science supported by DOE spans the full breadth from grand challenge, fundamental science through applied science in support of energy technologies. DOE has a long-standing commitment to the highest standards of scientific integrity in the research that we support at national laboratories, academic and other research institutions, and industry.

The DOE reflects the tenets of Gold Standard Science (GSS), covered in Executive Order (E.O.) 14303, in much of the Department's existing culture and management of scientific activities, including in its funding opportunities, resource allocations, award selection, and reporting requirements.

The purpose of this report is to provide an update on DOE's activities in support of Gold Standard Science activities within the context of the [Restoring Gold Standard Science DOE Implementation Plan](#). Starting from the strong foundation in the 2025 Implementation Plan, DOE has several new activities that support the overarching tenets of Gold Standard Science.

GENESIS MISSION

The Genesis Mission, launched by [Executive Order 14363](#) in November 2025, is a national effort led by the White House Office of Science and Technology Policy and DOE that will transform American science and innovation through the power of AI, strengthening the nation's technological leadership and global competitiveness.

Designed to double America's scientific productivity, the Genesis Mission brings together DOE's world-class scientific capabilities, advanced AI, high-performance computing, and the nation's leading researchers to transform how research is conducted.

Genesis Mission activities in 2025 included the initial development of the American Science and Security Platform, standing up the Genesis Mission Consortium, and identification of major research challenges. The 2026 Request for Applications based on these challenges generated the largest response to a funding opportunity in DOE history and announcement of 278 awards to date.

As host to this whole-of-government effort, DOE continues to grow partnerships with other agencies, including the Department of Health and Human Services, Department of the Interior, Department of Agriculture, Department of Transportation, Department of War, National Aeronautics and Space Administration, National Science Foundation, National Institute of Standards and Technology, Department of Homeland Security, Department of Veterans Affairs, and the Nuclear Regulatory Commission. The first international partnership for the Genesis Mission was also forged with Japan's Ministry of Education, Culture, Sports, Science and Technology.

SCIENCE: A NEW GOLDEN AGE

The White House OSTP released “[Science: A New Golden Age](#)” in July 2026, building on the “Restoring Gold Standard Science” Executive Order released in 2025. A section devoted to the Genesis Mission highlights the vision to advance American scientific leadership in the era of AI while recognizing challenges:

- Problem selection – identify scientific problems well-suited to AI intervention
- Institutional capacity – operationalize AI-powered science at a national scale
- Data infrastructure – provide access to existing data, and incentivize future data curation & sharing
- Integrate AI and experimental infrastructure – develop AI-driven, autonomous laboratories

DOE UPDATED GUIDELINES

DOE updated DOE Guidelines to modernize DOE National Laboratory operations. The update included a comprehensive review and updates to ~50 guidance documents to enhance efficiency of budget planning and execution, conduct of operations, and safety. Led by DOE leaders, laboratory leaders, and subject matter experts, new guidance documents were released in August 2026.

Built on recommendations from Congress and other independent reviews, the revised guidance preserves strong oversight, accountability, operational excellence, and protections for workers, the public, the environment, and the Nation’s nuclear security enterprise. This fulfills DOE’s commitment to GSS by improving efficiency, strengthening stewardship of taxpayer resources, and enabling DOE’s National Laboratories, plants, and sites to operate with speed, discipline, and agility to meet their missions, while maintaining rigorous safety and security standards.



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I. Implementation Plan

Progress on activities identified in the Restoring Gold Standard Science DOE Implementation Plan appear below, with updates for 2026 shown below the relevant section of the Implementation Plan.

- Reproducibility
 - DOE will improve reproducibility of results by **completing implementation of the 2023 Public Access Plan** following the Gold Standard Science tenets to provide free, immediate access to peer-reviewed, scholarly publications and maximize appropriate sharing of scientific data and code. Awards may include associated costs of public access implementation as allowable expenses.

Update for 2026

The DOE implemented the 2023 Public Access Plan for the Office of Scientific and Technical Information (OSTI) and DOE national laboratories through DOE Order 241.1 (revised October 2024, August 2026), and for financial awards through FAL 2026-01 (December 2025). DOE-supported researchers are required, barring sensitive trade secrets and IP information, to submit all publications to OSTI for public dissemination via DOE PAGES and OSTI.GOV.

The Data Management and Sharing Plan (DMSP) requirements were revised based on the 2023 Public Access Plan. DMSP requirements include publicly sharing scientific data generated in the course research in a manner that enables validation and specifying data repositories that align with federal guidance, while allowing for data sharing limitations that protect privacy, IP, and U.S. interests.

Supporting the tenets of transparency and reproducibility, DOE is broadly adopting **persistent identifiers for research outputs** and researchers. In addition, DOE's Office of Science has implemented **posting of public progress reports and abstracts** for **grants** and is now posting abstracts and progress reports for **national laboratory research** awarded through funding opportunities.

- DOE will employ **new mechanisms to ensure all scientific results, including agency-directed reports, undergo an enhanced scientific peer-review process by domain experts**. The peer-review process promotes the dissemination of accurate and reproducible evidence-based scientific results. Specific options include expanded use of RFIs on report topics and engagement of advisory committees and public forums (e.g., annual merit reviews) for initial presentation, discussion, and input on reports. DOE will investigate additional mechanisms to support open science infrastructure and practices.

Update for 2026

On July 7, 2025, the Secretary of Energy established the DOE Data, Modeling, and Analysis (DMA) Transparency Initiative to guarantee that energy systems analysis and modeling operations are executed in a rigorous manner. These efforts will ensure that regulatory actions are based on statutory requirements and cost-benefit calculations prioritize domestic equities. The DOE DMA Transparency and Standards Committee is developing the processes and procedures to implement this initiative.

The DOE Office of Science (SC) enhanced transparency and accountability by making more information about research awards publicly accessible. The historically available public abstracts for grants are now augmented by **public progress reports for SC grants and similar information for new laboratory awards**, available online through the SC Portfolio Analysis and Management System (PAMS). In addition, PAMS was integrated with Energy Link (E-Link), DOE's submission system for scientific and technical information, to provide an efficient submission of products for annual reporting and public dissemination.

The National Lab of the Rockies has improved transparency measure through improved descriptions of Regional Energy Deployment Systems, elimination of high renewable-target scenarios, updated representation of fossil fuel generation characteristics, public release of input data and associated scripts for NLR power systems models, and establishment of a technical review committee to provide feedback on NLR models and processes in a public forum.

- Transparency
 - The enhanced Data Management and Sharing Plan requirements in the 2023 Public Access Plan will ensure appropriate public sharing of scientific data, tools, and code for all DOE-funded R&D efforts, including specifying the timelines and specific repositories that will be used for release.

Update for 2026

The DOE has implemented new Data Management and Sharing Plan requirements, as described above.

- DOE will **continue to invest in mission-driven data resources that enable curated data sharing and will explore opportunities to increase interoperability**. These efforts will build upon initiatives to provide broader AI-ready data as part of DOE's research activities, including expansion of Public Reusable Research (PuRe) Data resources in the Office of Science and the development and deployment of the American Science Cloud to serve as a foundation for accelerating the DOE's mission through transformative AI models for science and engineering.

Update for 2026

DOE continued support for key data repositories, knowledge bases, and analysis platforms that serve as authoritative resources while advancing the DOE mission, including the Office of Science’s PuRe Data Resources, the Energy Data eXchange, the Open Energy Data Initiative, and the Energy Information Administration’s Open Data platform.

To lay the foundation for the Genesis Mission Platform, in 2025 DOE began investments in the American Science Cloud to connect computing, data, and experimental facilities into a unified system to accelerate discovery and shorten the path from research to real-world impact, strengthening U.S. leadership in energy, security, and advanced technology.

DOE and NNSA’s Project Alexandria is a data management and scalable data storage platform built to implement data governance standards and best practices across the Defense Nuclear Nonproliferation R&D space. The platform is the result of a collaboration among twelve DOE national laboratories.

- **DOE NOFOs will continue to include the specific criteria used for merit review of proposals, expanding standard text to reflect the Gold Standard Science tenets.** A cross-DOE forum will develop “best practices” and innovations to further promote transparency in the selection processes for awards, while maintaining the competitiveness of the process and mitigating conflicts of interest.

Update for 2026

NOFO templates were updated to align with the tenets of GSS. In addition to the standard processes and criteria used for merit review of proposals, the DOE NOFO template includes specific merit review criteria related to the tenets of GSS for inclusion as applicable:

- Extent to which the proposed project will communicate scientific results through peer-reviewed journals as part of the reporting for sponsored research
- Extent to which the proposed project demonstrates hypothesis-driven research articulating clear, falsifiable hypotheses with explicitly defined, measurable criteria, supported by solid experimental designs and statistical methods
- Extent to which the proposed project uses practices that enhance falsifiability (e.g., pre-registration of study protocols, use of appropriate control groups) and will encourage transparent reporting of null or negative results in publications and data repositories

- o DOE will continue using standardized, machine-readable metadata and require persistent identifiers for both researchers and research outputs to promote data provenance and tracking and connections across the research lifecycle.

Update for 2026

Office of Science solicitations now require a persistent identifier (PID) that meets NSPM-33 Implantation Guidance standards, such as an ORCID iD, be provided for all covered individuals in the common biographical sketch and financial disclosure forms (FAL 2024-05, FAL 2026-02).

DOE Standard Terms and Conditions for grants and cooperative agreements (updated June 2026) require individuals conducting R&D at the award and subaward level to obtain and use an NSPM-33 compliant PID when publishing R&D outputs.

DOE's Office of Science and Technical Information (OSTI) requires PIDs for many reported research products, including accepted manuscripts/journal articles, scientific data, technical reports, and scientific software, and offers PID services for data products to promote accurate provenance, tracking, and connections across the research lifecycle. DOE-supported researchers must provide their NSPM-33 compliant PID when reporting their products.

- Communicative of Error and Uncertainty
 - o DOE will continue to use the scientific peer-review process to enforce scientific community standards for communicating, and visualizing as appropriate, methodological constraints, assumptions, uncertainties, and confidence intervals associated with results. **NOFO text will be enhanced to further encourage communication of scientific results through peer-reviewed journals as part of the reporting for sponsored research.**

Update for 2026

Office of Science Scientific R&D NOFOs include the statement, "The recipient is expected to publish scientific results in peer-reviewed journals or otherwise make publicly available the results of the work conducted under any award resulting from this NOFO." Appropriate acknowledgement and documentation of uncertainty is an expected element of the peer-review process. In addition, DOE's Office of Science continues historic tradition of funding research proposals that seek to confirm or disprove claims made in the published scientific literature.

DOE Leadership established an in-depth review process for NOFO text prior to release to align technical requirements and programmatic goals with federal scientific integrity standards. The DOE-wide review of NOFOs further enhances alignment with the tenets of Gold Standard Science, including acknowledgement

and documentation of uncertainties and dissemination of results through peer-review processes.

- o DOE will continue to consider falsification of results and misrepresentation of conditions as research misconduct, and address accordingly. DOE's policy for research misconduct for financial assistance recipients is covered by 2 CFR Part 910.132, and the overarching federal regulations governing procedures for handling research misconduct allegations are found in 10 CFR Part 733, and 48 CFR Parts 935, 952 and 970.

Update for 2026

DOE's Office of Scientific and Technical Information (OSTI) fulfills agency-wide responsibilities to collect, preserve, and disseminate both unclassified and classified scientific and technical information emanating from DOE-funded research and development activities at DOE national laboratories, facilities, universities, and other institutions. OSTI provides public access to this information through the web, communicating the information consistent with transparency requirements.

For peer-reviewed journal articles, effective communication of the analysis results in the context of the degree of uncertainty is an expected element of the peer-review process.

DOE Leadership has established a robust process for the agency's public communication of scientific results, including DOE and national laboratory press releases and as well as public presentations by DOE staff, that involves review by relevant technical experts for scientific accuracy and the DOE Office of Public Affairs to ensure information is accessible and transparent to the American public.

- Collaborative and Interdisciplinary
 - o DOE will continue its rich history of advancing discovery science, applied research, and innovation through collaboration and interdisciplinary partnerships with academia, federal laboratories, other funding agencies, and private industry.

Update for 2026

DOE has expanded public-private partnerships, particularly in the areas of AI, quantum information science (QIS), and fusion energy.

In July 2026, DOE announced the first awards for teams under the Genesis Mission Request for Applications, part of President Trump's historic Genesis Mission to accelerate AI-driven scientific discovery. The 278 awards will address the nation's energy, scientific, and engineering challenges and involve 342

participating institutions, including national laboratories, universities, companies, nonprofit organizations, and other institutions.

The recently announced Quantum Genesis initiative will bring together national laboratories, universities, and private sector innovators to develop and deploy the world's first fault-tolerant, scientifically relevant quantum computing capability for research and development by 2028. The Quantum Genesis effort is a foundational computational element of the broader Genesis Mission.

The finalized Fusion Science and Technology Roadmap, a national strategy to develop and commercialize fusion energy, includes growing the U.S. fusion ecosystem through public-private partnerships, supply chain development, workforce growth, and commercialization pathways.

- o DOE will continue to facilitate collaboration through its funding opportunities, state-of-the-art user facilities, and DOE-supported community data resources.

Update for 2026

See first “Collaborative and Interdisciplinary” update above.

- o An appropriate balance among research modalities will continue to be assessed by DOE, recognizing that the balance will appropriately vary for fundamental science, applied research, and technology research activities. **Federal advisory committees and other public assessment options will be used to assess the balance of research modalities and their effectiveness.**

Update for 2026

The Department of Energy administered the notification of new membership for the President’s Council of Advisors on Science and Technology (PCAST).

The Office of Science (SC) consolidated six program-specific Federal advisory committees into a single advisory committee with a purview across the entire SC portfolio. In March 2026, the newly-established SC Advisory Committee (SCAC) was charged to develop reports in three critical areas:

- The “Genesis Mission” report will prioritize resources across SC to accelerate the application of AI for transformative scientific and engineering discovery focused on pressing national science and technology challenges and to create a decadal roadmap articulating near, mid, and long-term priorities for SC.
- The “Quantum Information Science” report will prioritize resources, strengthen U.S. leadership, and accelerate scientific discovery by providing a roadmap to identify near-term steps for a 2028 goal of an error-corrected quantum computer at a scale to enable revolutionary scientific advances.
- The “SC User Facilities” report will review proposed facilities and upgrades, identify gaps, and prioritize the new or upgraded facilities most crucial to the

needs of the nation for the next ten years (2026-2036), considering how the facilities support Administration priorities in the Genesis Mission, quantum information science, fusion, microelectronics, biotechnology, and discovery science.

- Skeptical of its Findings and Assumptions
 - o DOE will continue to foster a culture that encourages program managers for sponsored research to engage in active management of their portfolios, including critical reviews of research progress appropriate for each research project, which may include quarterly to annual processes, evaluation against pre-established milestones, and other decision points.

Update for 2026

Program Managers continue active management of their portfolios, including reviewing required progress reports to inform decisions on continuing support for active awards. Transparency has been enhanced by Public Progress Reports for each Office of Science award to inform the public about the accomplishments, impact, award performers, and scientific products.

The Office of Environmental Management (EM) has implemented changes in the management of its Technology Development program to include periodic reviews of activities awarded through proposals and with directed institutions. It is also tracking and reviewing progress against milestones and decision points through an on-line data tracking system that requires monthly update.

- o Research portfolios in fundamental science will continue to be designed to support differing approaches and scientific hypotheses to ensure progress towards understanding the underlying phenomena. For fundamental and applied research programs focused on advancing technologies, DOE will continue the long-standing approach of broad investment in nascent technologies without pre-selecting which will ultimately be the best commercially.

Update for 2026

DOE continues to support a broad portfolio across its mission space in fundamental and applied research. In addition to mission-driven targeted solicitations, funding announcements include open opportunities for applicants to submit their best ideas, such as the continually open Office of Science (SC) call for “any research within SC’s Congressionally authorized mission.”

The Office of Environmental Management (EM) is working to align technology development and R&D functions in the Chief Technology Officer (CTO) organization. The CTO has recently developed a structured approach to enhance coordination and assist in realizing the maximum potential from technology investment. The plan includes five attributes: Discover & Define Needs; Align &

Prioritize; Solicit Solutions; Evaluate & Select; and Sustain & Improve. The approach factors in the Assistant Secretary's vision for the department, historical external agency reviews, and programmatic lessons learned. The goal is to implement the plan in fiscal year 2027.

- Structured for Falsifiability of Hypotheses; Accepting of Negative Results as Positive Outcomes

DOE will revise the template for NOFOs to include these tenets of Gold Standard Science to the greatest extent possible. Specifically, text will broaden discussion of hypothesis-driven research to promote research proposals that articulate clear, falsifiable hypotheses with explicitly defined, measurable criteria, supported by solid experimental designs and statistical methods. In addition, the text revisions will promote practices that enhance falsifiability (e.g., pre-registration of study protocols, use of appropriate control groups) and will encourage transparent reporting of null or negative results in publications and data repositories. Transparent reporting of all results is essential to maximally inform the development of future research areas.

Update for 2026

The DOE introduced new merit review criteria in the DOE NOFO template, as described above.

- Subject to Unbiased Peer Review; Without Conflicts of Interest
 - DOE will continue to perform the review, selection, and awarding of grants and contracts in compliance with relevant federal code and the DOE policy and implementing order on scientific integrity to ensure an objective and unbiased process informed by independent merit review by domain experts.

Update for 2026

DOE released its final Conflict of Interest and Conflict of Commitment (COI/COC) regulations for applicants and recipients of financial assistance awards in July 2026. The new regulations are codified in 2 CFR Part 910 subpart C.

DOE continues to implement a rigorous merit review process that includes the use of subject matter experts without conflicts of interest who provide critical, unbiased input to agency decisions. The use of persistent identifiers for applicants and researchers helps identify potential conflicts of interest.

The rigorous evaluation process used for the 2026 Genesis Mission Request for Applications (RFA), which generated the largest response to a funding opportunity in DOE history, explored new ways to standardize and streamline review processes in a coordinated way across Department elements.

- o DOE will continue to enforce strict conflict-of-interest policies, as required by federal code and DOE scientific integrity policies, including the disclosure of potential conflicts of interest by applicants, reviewers, and agency officials involved in the funding or performance of research.

Update for 2026

See first “Subject to Unbiased Peer Review; Without Conflicts of Interest” update above.

- o **DOE will explore opportunities to further standardize and streamline elements of the impartial peer review process and consider innovative ways to apply double-blind review processes** given the constraints of the standard evaluation criteria required by federal code.

Update for 2026

See first “Subject to Unbiased Peer Review; Without Conflicts of Interest” update above.

- o DOE’s adoption of persistent identifiers for researchers will provide an additional technical mechanism for detection of conflicts of interest.

Update for 2026

See first “Subject to Unbiased Peer Review; Without Conflicts of Interest” update above.

II. Future Changes

To promote and monitor efforts to advance the tenets of Gold Standard Science, DOE will develop standardized metrics, evaluation mechanisms, and provide appropriate training and resources to agency personnel.

- **DOE will evaluate and consider revisions to relevant DOE Policies and Orders to strengthen their responsiveness to the tenets of Gold Standard Science**, including DOE P 411.2, DOE O 411.2, and DOE O 241.1C.

Update for 2026

DOE completed a comprehensive review of DOE Policy and Order documents to ensure alignment with Executive Orders and other Administration guidance, which resulted in updates to ~50 directives in August 2026, including DOE O 411.2 and DOE O 241.1. The

revised policies and orders streamline regulations and fully support DOE's ability to implement Gold Standard Science.

- **DOE will explore opportunities to create or revise standardized metrics to assess adherence to the tenets of Gold Standard Science** and their impact on scientific quality, including scientific and technical information collected by OSTI as well as data from DOE grants and other DOE-supported activities.

Update for 2026

OSTI has developed baseline metrics for persistent identifiers for researchers in the metadata it collects or develops for DOE-funded research outputs and will monitor/measure progress in considering if additional efforts are needed.

- **DOE will include evaluation criteria on adherence to the tenets of Gold Standard Science in external agency portfolio review activities**, including the Federal Advisory Committee reviews, through Committees of Visitors reviews of the Office of Science portfolios.

Update for 2026

The approach of using the SCAC advisory committee to prioritize aspects of the SC portfolio related to the Genesis Mission, Quantum Information Science, and investments in SC User Facilities reflects the GSS tenets of transparency, collaborative and interdisciplinary, skepticism of findings and assumptions, unbiased peer review, and without conflicts of interest.

- **DOE will develop training materials and resources to ensure agency personnel understand and adhere to the tenets of Gold Standard Science** when managing scientific activities.

Update for 2026

DOE has developed training materials on Scientific and Technical Information Management, emphasizing the requirements of DOE 241.1 and the DOE Public Access Plan. The training materials are available to the DOE research community and are managed and tracked through lab and site points of contact. These materials include guidance for making research outputs publicly accessible and for providing or obtaining persistent identifiers for researchers and their outputs.

- **DOE will explore opportunities to streamline and enhance aspects of proposal review and selection process with advanced AI-driven tools**, when practicable and appropriately addressing confidential information.

Update for 2026

Aligned with the DOE policy on the Use of Generative Artificial Intelligence (DOE P 203.1, December 2025), AI tools are being explored for opportunities to augment human decision-making, mitigate risks of bias and inaccuracy, and enable more efficient workflows. Examples are use of AI to determine the scientific/technical areas for applications and to identify pools of potential subject matter experts to consider for merit reviews.

Funding opportunity text now requires disclosure of an applicant's use of AI in developing their application. For example, from the 2026 Genesis Mission Request for Applications:

"DOE will apply a 'fair use' concept regarding the use of generative artificial intelligence to support investigators' efforts in presenting their intellectual work in an application. Guided by the principles expressed by others, applicants must disclose the use of any artificial intelligence tools in applications, unless the tools were used solely for editing an original draft."

- **DOE will ensure that any rulemaking or regulatory activity, especially DOE's Energy Appliance and Equipment Standards Program is predicated on Gold Standard Science.** This includes ensuring that highly unlikely and overly precautionary assumptions and scenarios should only be relied upon in DOE decision-making where required by law or otherwise pertinent to DOE's action.

Update for 2026

As noted above, the Secretary of Energy established the DOE Data, Modeling, and Analysis (DMA) Transparency Initiative to guarantee that energy systems analysis and modeling operations are executed in a rigorous manner.

III. Challenges

Several **potential challenges** will be carefully considered as the DOE moves forward in the implementation of the tenets of Gold Standard Science.

- The breadth of scientific activities DOE supports to advance its mission requires implementation for each scientific domain, i.e., acceptable data-sharing standards and timelines as well as expectations for the appropriate communication of results with uncertainty.
- Gold Standard Science tenets must be applied to the full breadth of DOE's activities, spanning basic research to applied research to development, demonstration, and deployment, regardless of technology readiness level.
- Constraints of federal code may limit the potential applicability of certain approaches, such as double-blind peer review processes.

- Efforts to enhance reproducibility will need to accommodate specific cases where fully recreating an analysis may be untenable (i.e., the dynamic field conditions faced by a demonstration project or the availability of high-performance computational power needed to reproduce a specific simulation or result).
- Research transparency improvements will need to be carefully balanced against the national security and business proprietary aspects of the DOE mission. Timelines for dissemination of results and underlying data must ensure appropriate protection of business proprietary information to enable the successful commercialization of the resulting technology.
- Standardizing approaches needs balance with common tools to aid the scientific management processes, allowing the DOE to act quickly on new ideas and innovative approaches to address the energy, environmental, and nuclear challenges of the American people.
- DOE will need to appropriately communicate the increased expectations for applicants and awardees to adhere to the tenets of Gold Standard Science throughout the research lifecycle, from proposal to performance and reporting, and ensure researcher compliance.
- The DOE will review increased burdens on the subject matter experts participating in merit review, peer-review, and other processes related to implementing the tenets of Gold Standard Science and may need to adjust procedures and processes accordingly.
- As DOE's role in the Genesis Mission incorporates activities of twenty Federal agencies, ensuring consistency with those agencies' GSS activities will be necessary.
- As DOE works with other Federal agencies to deliver on the Golden Age of Science Executive Order, ensuring consistency with those agencies' GSS activities will be necessary.