

**DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)
FUSION ENERGY SCIENCES (FES)**



MILESTONE-BASED FUSION DEVELOPMENT PROGRAM

**FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NUMBER:
DE-FOA-0002809**

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Amendment 000001 is issued to incorporate the paragraph in underlined text on Page 4.
Amendment 000002 is issued to incorporate the bullets in underlined text on Page 39.

FOA Issue Date:	September 22, 2022
Submission Deadline for Pre-Applications:	October 20, 2022 at 5 PM Eastern Time A Pre-Application is required
Pre-Application Response Date:	November 3, 2022 at 11:59 PM Eastern Time
Submission Deadline for Applications:	December 15, 2022 at 11:59 PM Eastern Time

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UPDATES AND REMINDERS

RECOMMENDATION

The Department of Energy (DOE) Office of Science (SC) encourages you to register in all systems as soon as possible. You are encouraged to submit pre-applications and applications well before the deadline.

CURRENT AND PENDING SUPPORT AND BIOGRAPHICAL SKETCHES

The instructions for the content of current and pending support and biographical sketches have changed. Please read the instructions carefully and follow them.

INTERAGENCY FORMATS FOR CURRENT AND PENDING SUPPORT AND BIOGRAPHICAL SKETCHES

Interagency common instructions for preparing current and pending support and biographical sketches are being developed. The Science Experts Network Curriculum Vitae (SciENcv) system at <https://www.ncbi.nlm.nih.gov/sciencv/> will be updated to support the forthcoming common instructions and formats. The fillable PDFs at <https://nsf.gov/bfa/dias/policy/nsfapprovedformats/> may not be available in the future. When interagency common formats and instructions are promulgated, their use will be required. SC strongly encourages all researchers to use the online SciENcv system to ensure that their documents are prepared in the appropriate format with the least inconvenience.

INDIVIDUALS WHO SHOULD NOT SERVE AS MERIT REVIEWERS

Follow the updated instructions in [Section VIII](#) and consider the use of the template available at <https://science.osti.gov/grants/Policy-and-Guidance/Agreement-Forms>. Do not include this list as part of the biographical sketch.

REPORTING AND ADMINISTRATIVE REQUIREMENTS

DOE is implementing enhanced reporting requirements for applications and awards. Reporting and administrative requirements, including but not limited to those pertaining to other sources of support and potential conflicts of interest or commitment, are subject to change before the Federal award date. The terms and conditions of award will specify changed requirements: Applicants have the right to reject any proposed awards. Terms and conditions may be modified at the time of an award modification: Recipients have the right to reject such modifications and allow an award to expire.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

SC guidance about how its support should be acknowledged is published at <https://science.osti.gov/funding-opportunities/acknowledgements/>.

PUBLIC ACCESS

Awards made under this FOA are subject to DOE's Public Access Plan (<https://www.energy.gov/downloads/doe-public-access-plan>). Full-text versions of scientific publications must be made publicly accessible at no charge to readers.

SC STATEMENT OF COMMITMENT

The DOE SC is fully and unconditionally committed to fostering safe, diverse, equitable, and inclusive work, research, and funding environments that value mutual respect and personal integrity. Discrimination and harassment undermine SC's ability to achieve its mission by reducing productivity, discouraging, or inhibiting talent retention and career advancement, and weakening the integrity of the SC enterprise overall. SC does not tolerate discrimination or harassment of any kind, including sexual or non-sexual harassment, bullying, intimidation, violence, threats of violence, retaliation, or other disruptive behavior in the federal workplace, including DOE field site offices, or at national laboratories, scientific user facilities, academic institutions, other institutions receiving SC funding, or other locations where activities funded by SC are carried out. All applicants and collaborators should familiarize themselves with the SC Statement of Commitment available at <https://science.osti.gov/SW-DEI/SC-Statement-of-Commitment>.

UPDATING YOUR PAMS PROFILE

All applicants are encouraged to update their profiles in the PAMS website at <https://pamspublic.science.energy.gov> regularly, at least annually, to ensure SC has your most up to date information. The PAMS profile now requires that individuals provide responses to the demographic related fields. SC strongly encourages personnel at applicant and awardee institutions, including Principal Investigators (PIs), Co-PIs, and other Key Personnel, to provide their demographic information. By providing your demographic information, you are assisting with SC's continued commitment to advancing diversity, equity, and inclusion in its business practices. Alternatively, for information you wish not to disclose, please select, "Do not wish to provide." Your individual demographic information will not be shared with peer reviewers and the information in your PAMS profile is protected by the requirements established in the Federal Privacy Act of 1974. Aggregate, anonymized demographic information may be shared with confidential review committees who are charged to evaluate the quality and efficacy of SC's business practices. For example, summary statistics of all applicants to or award selections from a particular SC FOA may be reviewed by a Committee of Visitors.

PDF GENERATION

The research narrative in an application must be one single machine-readable PDF file that contains the DOE Title Page, project narrative, all required appendices, and other attachments. This single PDF file may not be scanned from a printed document and must be attached in Field 8 on the Grants.gov form. This must be a plain PDF file consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders. The research narrative

will be read using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat. If combining multiple files into one research narrative, ensure that a PDF portfolio or binder is not created. If creating PDF files using any software other than Adobe Acrobat, please use a “Print to PDF” or equivalent process to ensure that all content is visible in the research narrative. Once a research narrative has been assembled, please submit the combined research narrative file through a “Print to PDF” or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat.

Checklist for Avoiding Common Errors:

Item	Issue
Page Limits	Strictly followed throughout application, including particular attention to: <ul style="list-style-type: none"> - Research Narrative - Appendix 2 Narrative, if any - Biographical sketches - Data Management Plan(s) (DMPs) - Letter(s) of Recommendation, if any
Personally Identifiable Information	None present in the application
Research Narrative	Composed of one PDF file including all appendices
Project Summary / Abstract	Name(s) of applicant, PI(s), PI's institutional affiliation(s), Co-Investigator(s), Co-Investigator's institutional affiliation(s)
DOE Title Page	Follow instructions closely
Budget*	Use current negotiated indirect cost and fringe benefit rates
Budget Justification (attached to budget) *	Justify all requested costs
Biographical Sketches	Follow page limits strictly and do not include list of collaborators. Attach the biographical sketch to the Senior/Key Person Profile (Expanded) Form.
Current and Pending Support	Ensure complete listing of all activities, regardless of source of funding. Attach the biographical sketch to the Senior/Key Person Profile (Expanded) Form.
List of Individuals who Should not Serve as Merit Reviews	Provided as separate file in application
Data Management Plans (DMP)	<ul style="list-style-type: none"> - Non-protected information must follow a DMP - See Section VIII for details
PDF Files	<p>Ensure that all PDF files comply with the following standards:</p> <ul style="list-style-type: none"> - Files must be machine-readable. - Files may not be scanned from a printed document. - Files must be plain PDF files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. - Files must not be PDF portfolios or

	<p>binders.</p> <ul style="list-style-type: none"> - Files must be readable in the full version of Adobe Acrobat - If combining multiple files into one research narrative, ensure that a PDF portfolio or binder is not created. - If creating PDF files using any software other than Adobe Acrobat, please use a “Print to PDF” or equivalent process to ensure that all content is visible.
DOE National Laboratories and/or DOE sites	<p>DOE National Laboratories and/or DOE sites are permitted to be a subrecipient under this FOA:</p> <ul style="list-style-type: none"> - Do not create new institutions in the PAMS website. - Submit applications in Grants.gov using the name of the laboratory or site in Field 5 of the SF-424(R&R) application form, not the contractor operating the laboratory or site. <p>Submissions under this FOA will be evaluated based on the merit review criteria. Any resulting funding, work, or awards will be made under the laboratory or site’s contract with DOE through the appropriate technology transfer mechanism, including a Strategic Partnership Project (SPP) agreement, Agreement for Commercializing Technology (ACT), or Cooperative Research and Development Agreement (CRADA). Any such agreements between for-profit lead entities and DOE/NNSA laboratories cannot include payments based on milestone completion. No separate financial assistance awards will be made. No administrative provisions of this FOA will apply to the laboratory or any laboratory subcontractor.</p>

Section I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Questions regarding the content of the FOA must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available on the FedConnect website (<https://www.fedconnect.net/>).

Questions pertaining to the FedConnect registration process or the submission of questions through FedConnect should be directed by email to support@FedConnect.net or by phone to the FedConnect Support Center at 1-800-899-6665.

Technical/Scientific Program Contact:

Dr. John Mandrekas
301-903-4095
John.Mandrekas@science.doe.gov

Administrative Contact (questions about budgets and eligibility):

Ms. Marty Carlin
301-903-3287
Marty.Carlin@science.doe.gov

STATUTORY AUTHORITY

Section 646 of Public Law 95-91, U.S. Department of Energy Organization Act
Section 901, et seq. of Public Law 109-58, Energy Policy Act of 2005
Section 2008 of the Energy Act of 2020, 42 U.S.C. § 18645(i)

APPLICABLE REGULATIONS

U.S. Department of Energy, Technology Investment Agreements, codified at 10 CFR Part 603

SUMMARY

Fusion energy is a potentially safe, abundant, zero-carbon-emitting source of reliable primary energy. Major recent worldwide advances in the science^{1,2,3} and technology⁴ of fusion energy,

¹ <https://www.llnl.gov/news/national-ignition-facility-experiment-puts-researchers-threshold-fusion-ignition>.

² H. Abu-Shawareb et al., “Lawson Criterion for Ignition Exceeded in an Inertial Fusion Experiment,” Phys. Rev. Lett. **129**, 075001 (2022); <https://www.nature.com/articles/d41586-022-00391-1>.

³ <https://www.euro-fusion.org/news/2022/european-researchers-achieve-fusion-energy-record>.

⁴ <https://news.mit.edu/2021/MIT-CFS-major-advance-toward-fusion-energy-0908>; <https://cfs.energy/news-and-media/cfs-commercial-fusion-power-with-hts-magnet>.

the emergence of a strong and growing private fusion sector in the United States and abroad,⁵ and the objective of achieving “net-zero” global carbon emissions by 2050⁶ have made the acceleration of fusion energy research, development, and demonstration (RD&D) a national priority. Augmenting the present scientific mission of the Office of Science (SC) Fusion Energy Sciences (FES) program with supporting “the development of a competitive fusion power industry in the U.S.” was both authorized in the Energy Act of 2020 and consistent with the recommendations of recent community-informed expert studies and reports, such as the 2020 Fusion Energy Sciences Advisory Committee (FESAC) Long-Range Plan *Powering the Future*⁷ and the 2021 National Academies of Sciences, Engineering, and Medicine (NASEM) report *Bringing Fusion to the U.S. Grid*.⁸ The latter helped motivate the White House Office of Science and Technology Policy (OSTP) and DOE to co-host a summit on *Developing a Bold Decadal Vision for Commercial Fusion Energy*.⁹ A common theme among these recent activities was the recognition that public-private partnerships (PPPs) present an opportunity to accelerate fusion energy RD&D. A DOE-sponsored *Workshop on Fusion Energy Development via Public-Private Partnerships* was held recently (June 1–3, 2022); workshop presentations are posted publicly on the FES website.¹⁰

This FOA invites applications for a new milestone-based fusion development program (as authorized in the Energy Act of 2020), which is a key component of the bold decadal vision to accelerate fusion energy RD&D in partnership with the private sector. Applications may be submitted for applied R&D to resolve scientific and technological issues toward the successful design of a fusion pilot plant (FPP).¹¹

It is expected that all applications will be led by the private sector with key partners that could include DOE national laboratories, academic institutions, non-profits, and other organizations/entities. Applicant teams should have a demonstrable range of technical and non-technical expertise needed for fusion energy R&D and eventual demonstration and commercialization. Non-Federal financial commitments will be required for all applications. Further information regarding awards and eligibility are provided in Sections II and III.

Energy justice (EJ) and Diversity, Equity, Inclusion, and Accessibility (DEIA) are integral to this program and to enabling a bold decadal vision for commercial fusion energy. Fusion has a unique opportunity to engage communities at the outset of its path toward demonstration and deployment to earn public acceptance and build a diverse workforce and industry that looks like

⁵ *The Global Fusion Industry in 2022*, [Fusion Companies Survey](#) by the Fusion Industry Association.

⁶ <https://www.iea.org/reports/net-zero-by-2050>.

⁷ https://science.osti.gov/-/media/fes/fesac/pdf/2020/202012/FESAC_Report_2020_Powering_the_Future.pdf

⁸ <https://nap.nationalacademies.org/catalog/25991/bringing-fusion-to-the-us-grid>

⁹ <https://www.whitehouse.gov/ostp/news-updates/2022/03/15/fact-sheet-developing-a-bold-vision-for-commercial-fusion-energy> and <https://www.whitehouse.gov/ostp/news-updates/2022/04/19/readout-of-the-white-house-summit-on-developing-a-bold-decadal-vision-for-commercial-fusion-energy>

¹⁰ <https://science.osti.gov/fes/Community-Resources/Workshop-Reports>

¹¹ An FPP should demonstrate a significant amount of net fusion electricity (e.g., >50 MWe) for >3 continuous hours (i.e., phase 1b of the NASEM report in footnote 8) with a timely path to one full power year (i.e., phase 2 of the NASEM report), at a total capital cost that can attract private funding.

and benefits all of America. These goals must be pursued in parallel¹² with the technical RD&D to enable timely commercialization. All applications must address EJ- and DEIA-related criteria (see below and Section V).

TECHNICAL DESCRIPTION

Applications shall propose a series of milestones toward realizing an FPP (as defined in footnote 11). *The initial project deliverables, by 18 months after award, are FPP preconceptual designs and technology roadmaps*, with the understanding that funding for subsequent milestones up to a total period of performance of five years will be contingent upon meeting early milestones and the availability of appropriated funding to continue this program in Fiscal Year (FY) 2024 and beyond.

As discussed in the NASEM report (footnote 8), a conceptual design of an FPP leading to preliminary and final engineering designs will be required. Table 5.1 in the NASEM report lists technical and non-technical actions that should be completed to enable conceptual, preliminary, and final designs. A preconceptual design would need to address the same issues as the conceptual design but at lower levels of fidelity and with greater uncertainties.¹³ As also discussed in the NASEM report (footnote 8), a technology roadmap¹⁴ identifies in detail the required critical-path R&D, including any intermediate test facilities, and focuses on the advances required for a particular FPP conceptual design.

Each application shall select one of two Tiers as described below. Applicants may submit a single application to one of the following Tiers, or a separate application to each Tier, with the understanding that at most one application per lead entity may be selected for award negotiations:

- **Tier 1:** Applications shall articulate a plausible path and proposed milestones leading to a successful preliminary design review (PDR),¹⁵ by the late 2020s, of an FPP (as defined in footnote 11) that can begin operations by the early 2030s. Significant commitment of non-Federal resources is expected for all Tier 1 applications, i.e., a majority of the total project cost (see Section III.B for details).
- **Tier 2:** Applications shall articulate a plausible path and proposed milestones leading to a significant improvement, as defined quantitatively by the applicant, in the fusion performance (including the physics basis and required enabling materials/technologies) of their proposed FPP concept by the mid/late 2020s. Applications shall further describe

¹² <https://www.whitehouse.gov/ostp/news-updates/2022/06/03/parallel-processing-the-path-to-commercialization-of-fusion-energy>.

¹³ For further information and details on the various design stages, see, e.g., Appendix C-4 of DOE O 413.3B; <https://www.directives.doe.gov/directives-documents/400-series/0413.3-BOrder-b>.

¹⁴ For the purposes of this FOA, a technology roadmap is a schedule that identifies in detail the major R&D and innovation needs, with clear deliverables and how they relate to the design, construction, and operation of the FPP and subsequent commercialization. Interdependencies are identified, and back-up options are noted where appropriate.

¹⁵ See Chapter 5 and Table 5.1 (“Preliminary Design” column) of the NASEM report (footnote 8) for what is ideally needed prior to a successful PDR, including but not limited to successful demonstrations of the physics basis and enabling materials/technologies to enable a reasonable extrapolation to an FPP.

how the improved performance may lead to a successful PDR (see footnote 15), by the early 2030s, of an FPP (as defined in footnote 11) that can begin operations by the late 2030s. Significant commitment of non-Federal resources is expected, i.e., a majority of the total project cost, although lower fractions $\geq 20\%$ may be considered for awards made under an expenditure-based TIA (see Section III.B for details).

If an applicant is interested in participating in this program even if not selected for Federal funding, in order to benefit from DOE validation of milestones and milestone completion, please indicate your interest in this prominently in your application. If this is the only way an applicant wishes to participate in the program, please indicate \$0 for all federal amounts in the milestone table below. If applicants are not requesting Federal funds, budget information/documents are not required. DOE reserves the right to negotiate milestones and require appropriate agreements with any, all, or none of the applicants that request to participate in this program without federal funding.

Include a milestone table as shown below. Milestones should reflect critical-path scientific/technical, business/financial, commercialization, and EJ/DEIA-related (including socio-technical)¹⁶ deliverables. Provide estimated total and requested federal funding amounts for each milestone. Applicants are strongly encouraged to include particular milestones to address the following scientific and technical requirements, if applicable within the 5-year period of performance:

- Achieve plasma conditions (i.e., the required Lawson parameter $n\tau$ and ion temperature T_i)¹⁷ needed for a significant improvement in equivalent (i.e., using D-D instead of the actual commercial fuel) scientific energy gain up to and beyond $Q>1$
- Achieve scientific energy gain $Q>1$ using the chosen commercial fuel cycle
- Heat-exhaust and plasma-facing-component (PFC) solutions for the FPP
- Sustainable fuel-cycle solution, including blanket and tritium processing if applicable, for the FPP
- Actuators and key enabling technologies.

Provide a concise narrative to justify the substance of each milestone. Include a concise narrative in the Budget Justification (separate PDF upload, see Section IV.D) to assist the Contracting/Grants Officer(s) and Program Team in determining the reasonableness of the total cost to fulfill each milestone.

¹⁶ A “socio-technical” milestone is one where consideration of EJ and/or public acceptance wholly or partially motivates demonstration of a particular technical requirement, e.g., materials specifications to avoid generating nuclear high-level waste or a blanket/tritium-system design to minimize tritium site inventory, etc.

¹⁷ For precise definitions of Lawson parameter and scientific energy gain, see, e.g., S. E. Wurzel and S. C. Hsu, *Phys. Plasmas* **29**, 062103 (2022); free download at <https://doi.org/10.1063/5.0083990>.

Milestone #	Milestone title	Milestone completion criteria	Estimated total cost to fulfill milestone (\$M)	Requested federal share (\$M)	Quarter due (from award date)
1					e.g., Q1
2					e.g., Q2
	FPP preconceptual design (must include this milestone)	Written report and oral presentation to DOE			No later than Q6
	FPP technology roadmap (must include this milestone)	Written report and oral presentation to DOE			No later than Q6
Etc.	Add rows as needed				
	Final milestone (must include this milestone)	Written report and oral presentation to DOE documenting successful preliminary design review (PDR) of FPP (Tier 1) or demonstration of significant performance improvement (Tier 2)			Q20 or earlier

Applications should provide the information enumerated below to the extent practicable. Tier-2 applications may have lower fidelity in the information provided relative to Tier-1 applications. Scientific and technical assertions should be supported by experimental data and theory/modeling-based analysis to the extent possible, with citations to peer-reviewed publications if available.

1. Scientific and technical considerations:

- a. Strategy and risks for achieving the required performance increases (both for major intermediate milestones and for an FPP) in Lawson parameter $n\tau$, ion temperature T_i , and scientific energy gain Q , relative to present state-of-the art of the proposed concept
- b. If the proposed concept relies on a significant non-thermal (i.e., non-Maxwellian) ion population, a scientifically and technically plausible path to the required values of Q for an FPP must be adequately addressed
- c. Strategy for eventual high-duty-cycle operation (i.e., steady-state or repetitively pulsed) with the required plasma scenarios, actuators, and “wall-plug” efficiencies
- d. Strategy for a viable integrated first wall (including divertor if applicable) and blanket, including materials gaps/requirements and plans for securing materials-qualification data for FPP and commercial first-of-a-kind (FOAK) fusion plant
- e. Strategy for demonstrating a closed and sustainable fuel cycle, including securing start-up tritium or ^3He and/or enriched ^6Li supplies if applicable
- f. Other major scientific and technological gaps between the present performance

- level of the proposed concept and (i) FPP and (ii) scientific breakeven
 - g. Power-cycle R&D (electricity generation), including advanced thermal or direct conversion if applicable
 - h. Technical performance gaps from proposed FPP to commercial FOAK (based on applicant team's own requirements of each)
 - i. Other S&T needs/risks not captured above
 - j. Appropriateness of scientific/technical team and management plan/structure, including named collaborating institutions (e.g., DOE national laboratories or universities) and senior investigators as part of this application
2. Commercialization considerations
 - a. Identification of targeted markets and target economics set by competitive state-of-the-art
 - b. Models for eventual generation of revenue and profit
 - c. Projected total capital cost for FPP, including engineering design, construction, and commissioning
 - d. Projected total capital costs for commercial FOAK, levelized-cost-of-electricity (LCOE), and other market-relevant cost targets
 - e. Basis for projected FPP and FOAK range of costs and schedules.
 - f. Strategy and preliminary plans for addressing supply-chain and waste-management issues
 - g. Strategy for addressing reliability, accessibility, maintainability, and inspectability (RAMI)
 - h. Connection to grid if applicable
 - i. Safety envelope, regulatory, and licensing
 - j. Siting of major facilities and FPP
 - k. Commercialization partners
 - l. Nonproliferation, nuclear security, and cybersecurity considerations
 - m. Plans to address risks/issues that may prevent widespread public acceptance of your fusion concept/technology
 - n. Other commercialization risks not captured above
 3. Business and financial considerations
 - a. Appropriateness and experience of company technical/business leadership and board
 - b. Total number of funding rounds and amounts raised, names of investors that participated in each round (to the extent this can be disclosed), and dates of each funding round
 - c. Future plans and status of private fundraising
 - d. Management of intellectual property (IP), including IP arising from multi-institutional collaboration.

Community Benefits Plan: Energy Justice (EJ) and Diversity, Equity, Inclusion, and Accessibility (DEIA)

To support the goal of building a clean and equitable energy economy, consistent with DOE's

Justice40 policy priorities,¹⁸ projects are expected to (1) support meaningful community and labor engagement; (2) invest in America’s workforce; and (3) advance DEIA. To ensure that these goals are met, applications shall include in the main narrative a **Community Benefits Plan** (up to 5 pages in length) that describes how the proposed project would incorporate the three objectives stated above. At this stage of the application process, the Community Benefits Plan should indicate the applicant’s intention to engage meaningfully with community stakeholders on these goals.

The applicant’s Community Benefits Plan shall include at least one Specific, Measurable, Assignable, Realistic and Time-based (SMART) milestone per year in order to measure progress on the proposed actions (include in the milestone table above). The Community Benefits Plan will be evaluated as part of the merit review process. If the project is selected, DOE will incorporate the Community Benefits Plan into the award, and the recipient will be required to meet the Community Benefits Plan it proposed. During the life of the DOE award, DOE will evaluate the recipient’s progress.

1. Community and Labor Engagement: The Community Benefits Plan shall describe the applicant’s actions to date and future plans to engage with community stakeholders, such as but not limited to environmental groups, labor unions, local governments, tribal governments, and community-based organizations that support or work with disadvantaged,¹⁹ underserved,²⁰ and underrepresented²¹ communities. By facilitating community input, social buy-in, and accountability, such engagement can substantially reduce or eliminate stalls or slowdowns, litigation, and other risks associated with subsequent demonstration and commercialization activities.

2. Investing in the American Workforce: A well-qualified workforce is necessary to ensure project stability, continuity, and success, and to meet program goals. Job quality is critical to attracting and retaining the qualified workforce required.

The Plan shall describe the applicant’s approach to investing in workforce education and training of both new and incumbent workers and ensuring that jobs are of sufficient quality to attract and retain skilled workers in the industry.

Specific components of the Plan shall include:

- A) A summary of the applicant’s plan to attract, train, and retain a skilled and well-

¹⁸ <https://www.energy.gov/diversity/justice40-initiative>.

¹⁹ See definition of Disadvantaged Communities (DACs) and online tool for identifying DACs at <https://www.energy.gov/diversity/justice40-initiative>.

²⁰ Communities identified as disadvantaged or underserved communities by their respective States; communities identified on the Index of Deep Disadvantage referenced at <https://news.umich.edu/new-index-ranks-americas-100-most-disadvantaged-communities/>, and communities that otherwise meet the definition of DACs stated above.

²¹ According to the National Science Foundation’s 2019 report titled, “Women, Minorities and Persons with Disabilities in Science and Engineering”, women, persons with disabilities, and underrepresented minority groups—blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are vastly underrepresented in the STEM (science, technology, engineering and math) fields that drive the energy sector. That is, their representation in STEM education and STEM employment is smaller than their representation in the U.S. population. <https://nces.nsf.gov/pubs/nsf19304/digest/about-this-report>. For example, in the U.S., Hispanics, African Americans and American Indians or Alaska Natives make up 24 percent of the overall workforce, yet only account for 9 percent of the country’s science and engineering workforce. DOE seeks to inspire underrepresented Americans to pursue careers in energy and support their advancement into leadership positions.

qualified workforce. A collective bargaining agreement, project labor agreement, labor-management partnership, or other similar agreement would provide evidence of such a plan. Alternatively, applicants may describe:

- i. commitments to support workforce education and training, including measures to reduce employee turnover costs for employers, increase productivity from a committed and engaged workforce, and promote a nimble, resilient, and stable workforce for the project; and
- ii. efforts to engage employees in the design and execution of workplace safety and health plans.

3. DEIA: The Community Benefits Plan shall include a section describing how DEIA objectives will be incorporated into the project. The section should detail how the applicant will partner with underrepresented businesses, educational institutions, and training organizations that serve workers who face barriers to accessing quality jobs, and/or other project partners to help address DEIA.

The following is a non-exhaustive list of potential DEIA actions that could be included in a Plan. This list is offered to provide guidance to applicants and is not intended to be comprehensive or mandatory.

- A) Commitment to partner with Minority Business Enterprises, Minority-Owned Businesses, Woman-Owned Businesses, and Veteran-Owned Businesses for contractor support needs
- B) To fill open positions for the DOE-funded project, partner with workforce training organizations serving underrepresented communities and those facing systemic barriers to quality employment such as those with disabilities, returning citizens, opportunity youth, and veterans
- C) Advance DEIA in the applicant team and organizations through evidence-based practices, with an emphasis on all aspects of DEIA and not only diversity

Applicants may provide letters of support from representative organizations reflecting substantive engagement and feedback on applicant's approach to community benefits (including to the American workforce) and DEIA.

Multi-Institutional Teams

SC uses two different mechanisms to support teams of multiple institutions.

COLLABORATIVE APPLICATIONS

Collaborative applications (in which each team member submits its own application with a common research narrative) will not be accepted under this FOA.

SUBAWARDS²²

Multi-institutional teams must submit one application from a designated lead institution with all other team members proposed as subrecipients.

²² Subawards are made to subrecipients.

DOE/National Nuclear Security Administration (NNSA) National Laboratories,²³ other Federal agencies, and another Federal agency's Federally Funded Research and Development Center (FFRDCs),²⁴ if participating in a team led by private industry, may be proposed as subrecipients.

All entities submitting applications to this FOA must recognize the regulatory and legal obligations to comply with export controls and policies that limit the transfer of technologies with potential dual use. Applicants are reminded that international activities must comply with nonproliferation, sanction, and other protocols described at <https://www.export.gov>.

International activities related to special nuclear materials (SNM) are subject to additional requirements. Please see 10 CFR 810 for further information.

This FOA may support endeavors that could lead to scholarly publications. Do not submit applications containing restricted data or unclassified controlled nuclear information as defined in the Atomic Energy Act of 1954, as amended, 42 USC 2011, et seq., 10 CFR 1017, 10 CFR 1045.

23 The phrase "National Laboratories" is used broadly to encompass DOE/NNSA laboratories and sites capable of performing the work described in this FOA..

24 An authoritative list of all Federally Funded Research and Development Centers (FFRDCs) may be found at <https://www.nsf.gov/statistics/ffrdelist/>

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding Other Transactions (OT) agreements via Technology Investment Agreements (TIAs) under this FOA. Multi-institutional teams must apply using a prime and subaward model with one application submitted by the lead organization.

DOE implements its OT authority through awarding and administering TIAs (governed by 10 CFR 603). TIAs are assistance instruments used to increase the involvement of commercial entities in DOE's research, development, and demonstration programs. DOE has greater flexibility in tailoring the terms and conditions of a TIA. Further, for TIAs, Award Special Terms and Conditions for financial assistance awards are negotiable in areas such as audits, cost accounting standards (CAS), and intellectual property rights that may cause concern for commercial firms. In a TIA, DOE may modify the standard government terms and conditions, including but not limited to:

- Intellectual Property Provisions: DOE may negotiate special arrangements with recipients to avoid the encumbrance of existing intellectual property rights or to facilitate the commercial deployment of inventions conceived or first actually reduced to practice under the DOE funding agreement.
- Accounting Provisions: DOE may authorize the use of Generally Accepted Accounting Principles (GAAP) where recipients do not have accounting systems that comply with government recordkeeping and reporting requirements.

If a DOE/NNSA FFRDC contractor is a part of a teaming arrangement, it is expected that the DOE/NNSA FFRDC contractor will perform work under the laboratory's Management and Operating (M&O) contract through a Strategic Partnership Project (SPP) agreement, Agreement for Commercializing Technology (ACT), or Cooperative Research and Development Agreement (CRADA as negotiated with the lead entity. Funding for another Federal agency or its FFRDC may also be received through a CRADA or other agreement as negotiated by the lead organization.. Certain types of information described in 10 CFR Part 603.420(b) are exempt from disclosure under the Freedom of Information Act.

Substantial Involvement

DOE will include a term and condition in the award that addresses DOE input to the recipient regarding the management, direction, and performance of the project. Substantial involvement shall also include disbursement of Federal funds pursuant to project performance and termination of the agreement or suspension of payments in accordance with the terms of the agreement. DOE will be engaged in an advisory capacity for work performed under the agreement.

B. ESTIMATED FUNDING

DOE anticipates that the Federal share of the total value of awards over the first 18 months of this program will be \$50M, subject to the availability of FY23 appropriations, to support

milestone-based fixed payments (fixed-support TIAs) or cost reimbursements (expenditure-based TIAs) for the initial milestones of awardees up to delivery of FPP pre-conceptual designs and technology roadmaps, as described in Section I of the FOA. Additional funding for subsequent milestones up to a total period of performance of five years will be contingent upon awardees meeting early milestones and the availability of appropriated funding to continue this program in FY24 and beyond. Applicants should designate three budget periods of 18, 18, and 24 months in duration, respectively.

DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

C. MAXIMUM AND MINIMUM AWARD SIZE

(See [B. Estimated Funding](#) above.)

The award size will depend on the number of meritorious applications and the availability of appropriated funds.

The ceiling and floor described in this FOA represent the expected range of award sizes. Applicants should request sufficient funding to achieve their proposed results.

Ceiling

\$25,000,000

Floor

\$5,000,000

D. EXPECTED NUMBER OF AWARDS

(See [B. Estimated Funding](#) above.)

DOE anticipates awarding between three and five (3–5) awards; the exact number of awards depend on the number of meritorious applications selected and the availability of appropriated funds.

E. ANTICIPATED AWARD SIZE

(See [B. Estimated Funding](#) above.)

DOE anticipates award sizes between \$5M and \$25M of Federal funding, depending on the number of meritorious applications and the availability of appropriated funds.

F. PERIOD OF PERFORMANCE

(See [B. Estimated Funding](#) above.)

DOE anticipates making awards with a project period of performance of a maximum of 5 years (see Sections I and II.B), with initial funding covering only the first 18 months. The intent is to allow awardees to continue pursuing their negotiated milestones up to 5 years, with continuation beyond 18 months contingent on: (1) availability of funds appropriated by Congress and future-year budget authority, (2) continued fulfillment of negotiated milestones, and (3) compliance with the terms and conditions of the award. Applicants should designate three budget periods of 18, 18, and 24 months in duration, respectively.

G. TYPE OF APPLICATION

DOE will accept only new applications under this FOA.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

Applications may only be submitted by for-profit domestic entities or the subsidiaries/affiliates of for-profit foreign entities that are incorporated in the United States, including U.S. territories. See Section 2306 of the [Energy Policy Act of 1992, 42 U.S.C. 13525](#). Applications led by a foreign entity must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate. All work under the award must be performed in the United States, but the applicant may request a partial waiver of this requirement.

The following domestic entities are eligible to apply as a member of a multi-institutional team, but not as the lead institution nor as a standalone applicant:

- DOE/NNSA and non-DOE FFRDCs
- Academic institutions
- Nonprofit organizations, except those described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995
- State, local, and tribal government entities
- Federal agencies and instrumentalities (other than DOE).

Eligibility of lead applicants is restricted to for-profit entities because for-profit entities are the only entities capable of meeting “particular technical milestones before a participant is awarded funds by the Department.” 42 U.S.C. § 7256(i)(1).

B. NON-FEDERAL FUNDING OR COST SHARE

Awards Made Under TIAs

Fixed-Support TIAs

Cost sharing for research of an applied nature under fixed-support TIAs has been eliminated from the requirements of Section 988 of the Energy Policy Act of 2005 (this FOA anticipates research of an applied nature). However, applicants selecting a fixed-support TIA as the award instrument are expected to provide non-Federal resources exceeding half the total project cost regardless of Tier. For this FOA, it is anticipated that most or all TIAs awarded will be fixed-support TIAs (10 CFR 603.305), for which the DOE Contracting Officer can eliminate or reduce some post-award requirements (10 CFR 603.315), including cost principles and accounting standards. Fixed-support TIAs enable fixed payments of a pre-negotiated amount upon verified milestone completion and require less detailed budget information in the application than expenditure-based TIAs (see next paragraph and Section IV). Applicants should provide minimally adequate information in their budget forms and justification (see Section IV) to assist the Grants/Agreement Officer(s) with their assessment of the value and reasonableness of the applicant’s proposed total project cost and fraction of non-Federal funding (10 CFR 603.525 through 603.555). Applicants must submit affirmative statements from any third parties identified as sources of cash contribution (10 CFR 603.525).

Expenditure-Based TIAs

To the maximum extent practicable, applicants should provide at least 50% cost sharing. The DOE Contracting Officer may consider whether at least 50% cost sharing is impracticable in a given case; however, cost sharing must not be less than 20%. Before deciding that at least 50% cost sharing is impracticable, the DOE Contracting Officer will consider if there are other factors that demonstrate the applicant's self-interest in the success of the current project. Expenditure-based TIAs (10 CFR 603.300 and 10 CFR 603.310) are subject to cost principles and accounting standards and require detailed budget information as part of the application (see Section IV). Cost sharing must be in accordance with 10 CFR 603.525 through 603.555, and applicants must submit affirmative statements from any third parties identified as sources of cash contribution (10 CFR 603.525).

C. ELIGIBLE INDIVIDUALS

Not applicable.

D. LIMITATIONS ON SUBMISSIONS

A particular lead entity may submit up to two (2) distinct pre-applications or applications, one each to Tier 1 and Tier 2. DOE will consider the latest received submissions to be the institution's intended submissions. Pre-applications or applications more than the limited number of submissions may be discouraged.

Section IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <https://www.Grants.gov>, select “Search Grants”, and then enter the Catalog of Federal Domestic Assistance (CFDA) number (81.049) and/or the FOA number shown on the cover of this FOA. Select the “Apply” button to access the application package.

Applications submitted through www.FedConnect.net will not be accepted. Applications may not be submitted through PAMS at <https://pamspublic.science.energy.gov>.

B. LETTER OF INTENT (LOI) AND PRE-APPLICATION

1. Letter of Intent (LOI)

Not applicable

2. Pre-application

PRE-APPLICATION DUE DATE

The pre-application due date is printed on the cover of the FOA.

ENCOURAGE/DISCOURAGE DATE

The pre-application response date is printed on the cover of the FOA.

A pre-application is required and must be submitted by the date indicated on the cover of the FOA.

Pre-applications will be reviewed for programmatic responsiveness to this FOA. DOE will send a response by email to each applicant encouraging or discouraging the submission of an application by the date indicated on the cover of the FOA. Applicants who have not received a response regarding the status of their pre-application by this date are responsible for contacting the program to confirm this status.

Applications that have not been encouraged by DOE may be declined without merit review.

The pre-application must include, at the top of the first page, the following information:

- Title of Pre-application
- Principal Investigator Name, Job Title
- Institution
- PI Phone Number, PI Email Address
- FOA Number: Include the FOA Number indicated on the cover of this FOA
- Tier 1 or 2

This information must be followed by a clear and concise description of the following:

- FPP concept and commercial market(s) being pursued
- Approximate FPP scientific/technical and commercial/economic requirements
- Key performance gaps (be quantitative to the extent possible) from present state-of-the-art to your FPP in the three key S&T areas as outlined in the FESAC Long-Range Plan (footnote 7): achieving and sustaining (pulse duration and/or repetition rate) adequate energy gain, engineering for extreme conditions, and sustainable fuel cycle
- Anticipated further gaps from FPP to commercial first-of-a-kind (FOAK) fusion plant
- Description and justification of team, including teaming organizations and key personnel (expertise)
- Brief description of proposed activities in support of EJ and DEIA
- Sparse outline/schedule of major milestones to be proposed, including S&T, commercialization business/financial, and EJ/DEIA milestones, up to a maximum project period of performance of five (5) years
 - Should end with successful PDR of an FPP (Tier 1) or demonstration of significant performance improvement (Tier 2), as defined by the applicant, both by the late 2020s
 - Intermediate milestones by 18 months must include delivery to DOE of FPP preconceptual design and technology roadmap, and measurable EJ and DEIA progress and influence on the overall plan
- Rough estimate of total five (5)-year project cost and fraction of non-Federal share
- Applicant's resources that are necessary to the project (necessary resources), including total cash in hand relevant to this project, projected runway (months) with available funds, plans for future private fundraising
- Preferred contractual option (not binding), i.e., fixed-support or expenditure-based TIA (see Sections II and III.B).

The pre-application may not exceed four (4)-pages, when printed using standard letter-size (8.5-inch x 11 inch) paper with 1-inch margins (top, bottom, left, and right). The font must not be smaller than 11-point font. Figures and references, if included, must fit within the four (4)-page limit.

In addition, the pre-application may include a listing of individuals who should not serve as merit reviewers of a subsequent application due to potential conflicts of interest. This does not count toward the four (4)-page limit. Detailed instructions for how to craft such a listing are provided in [Section VIII](#) of this FOA. This listing will not count toward the pre-application's page limit. The list of individuals must be converted to a PDF file and appended to your pre-application for submission through the PAMS website at <https://pamspublic.science.energy.gov>.

The pre-application must be machine-readable. Do not submit a scanned image of a printed document.

PRE-APPLICATION REVIEW

Those pre-applications that are encouraged will be used to help SC begin planning for the application peer-review process. SC's intent in discouraging submission of certain applications is to save the time and effort of applicants in preparing and submitting applications not responsive to this FOA.

The PI will be automatically notified when the pre-application is encouraged or discouraged. The DOE SC Portfolio Analysis and Management System (PAMS) will send an email to the PI from PAMS.Autoreply@science.doe.gov, and the status of the pre-application will be updated at the PAMS website <https://pamspublic.science.energy.gov/>. Notifications are sent as soon as the decisions to encourage or discourage are finalized.

PRE-APPLICATION SUBMISSION

Pre-applications are created in the software system of your choice and must be submitted electronically through the DOE SC Portfolio Analysis and Management System (PAMS) website <https://pamspublic.science.energy.gov/>

Pre-applications may be submitted by a PI or by other users at the PI's institution with the "Submit to DOE" privilege in PAMS.

Applicants are strongly encouraged to inform their DOE Program Manager if teaming arrangements, proposed personnel, topics, or the anticipated title change between submitting the pre-application and when an application is submitted, to ensure that their application is properly linked to their pre-application and that reviewers are properly assigned to the proposal.

Detailed instructions about how to submit a pre-application are in [Section VIII](#) of this FOA.

C. GRANTS.GOV APPLICATION SUBMISSION AND RECEIPT PROCEDURES

Applications in response to this FOA must be submitted through Grants.gov. Detailed instructions for registering in and using Grants.gov are in [Section VIII](#) of this FOA.

D. CONTENT AND APPLICATION FORMS

LETTERS

Letters from collaborators or from institutions providing access to equipment and/or facilities may be appended to your research narrative and are not considered part of the research narrative's page limit. Please ensure that letters from collaborators or from institutions providing access to equipment and/or facilities only describe the nature of the collaboration or the access to equipment and/or facilities: Letters of support or recommendation are not allowed in applications under this FOA.

1. SF-424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in

accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 is available on the DOE Financial Assistance Forms Page at <https://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances. Applicants are bound by their representations and certifications in SAM.gov.

Applicants requesting a fixed-support TIA are only required to provide bottom-line numbers in each of sections (A-K) of the SF-424(R&R) Budget. Line-item details are not required for fixed-support TIAs.

All applicants should specify 3 budget periods of 18, 18, and 24 months, respectively.

UEI AND EIN NUMBERS (FIELDS 5 AND 6)

The UEI and Employer Identification Number (EIN) fields on the SF-424 (R&R) form are used in PAMS to confirm the identity of the individual or organization submitting an application.

- Enter the UEI as a 12-digit alpha-numerical sequence
- Enter the EIN as a nine-digit number
- Do not use hyphens or dashes. SC does not use the 12-digit EIN format required by some other agencies

TYPE OF APPLICATION (FIELD 8)

A **new** application is one in which DOE support for the proposed research is being requested for the first time. A **renewal** application requests additional funding for a period of time following a current award. If the application requests a significant change in the scope of work, please consult with the Program contact identified in this FOA to determine if the application should be considered new or a renewal. This FOA accepts only **new** applications.

SC does not make use of the Resubmission or Continuation options.

Applications for supplemental support of an existing award should be marked as “Revision.”

Please answer “yes” to the question “Is this application being submitted to other agencies?” if substantially similar, identical, or closely related research objectives are being submitted to another Federal agency. Indicate the agency or agencies to which the similar objectives have been submitted.

Do not attach pre-applications to Field 21 of the SF-424(R&R) form or letters of intent to Field 21 of the SF-424(R&R) form. Doing so will render your application unreadable.

2. Research and Related Other Project Information

Complete questions in fields one (1) through six (6) of the SF-424 Research and Related Other Project Information form.

Note regarding question 4.a. and 4.b.:

If any environmental impact, positive or negative, is anticipated, indicate “yes” in response to question 4.a., “potential impact – positive or negative - on the environment.” Disclosure of the impact should be provided in response to question 4.b. First indicate whether the impact is positive or negative and then identify the area of concern (e.g., air, water, exposure to radiation, etc.). Should the applicant have any uncertainty, they should check “yes.”

DOE understands the phrase in field 4.a., “potential impact ... negative” to apply if the work described in the application could potentially have any of the impacts listed in (1) through (5) of 10 CFR 1021, Appendix B, Conditions that Are Integral Elements of the Classes of Action in Appendix B. (<https://www.ecfr.gov>)

Additionally, for actions which could have any other adverse impacts to the environment or have any possibility for adverse impacts to human health (e.g., use of human subjects, Biosafety Level 3-4 laboratory construction/operation, manufacture or use of certain nanoscale materials which are known to impact human health, or any activities involving transuranic or high level radioactive waste, or use of or exposure to any radioactive materials beyond de minimis levels), applicants should indicate a “negative” impact on the environment.

Lastly, 1) if there would be extraordinary circumstances (i.e., scientific or public controversy) related to the significance of environmental effects (10 CFR 1021.410 (b)(2)), 2) if the work is connected to other actions with potentially significant impacts (10 CFR 1021.410 (b)(3)), or 3) if the work is related to other nearby actions with the potential for cumulatively significant impacts (10 CFR 1021.410 (b)(3)), applicants should indicate a “negative” impact on the environment.

The bulk of your application will consist of files attached to the Research and Related Other Project Information form. The files must comply with the following instructions:

PROJECT SUMMARY/ABSTRACT (FIELD 7 ON THE FORM)

The project summary/abstract is a summary of the proposed activity suitable for distribution to the public and sufficient to permit potential reviewers to identify conflicts of interest. It must be a self-contained document. The project summary/abstract must be comprised of

- A cover sheet containing the name of the applicant, the project title, the PI and the PI’s institutional affiliation, and any coinvestigators and their institutional affiliations
- This information must be followed by the objectives of the project, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes).
- The description of the proposed research may not exceed one page when printed using standard letter-size (8.5 inch x 11 inch) paper with 1-inch margins (top, bottom, left, and right). The font must not be smaller than 11 point font. Figures and references, if

included, must fit within the one-page limit.
A sample is provided below:

Project Title
A. Smith, Lead Institution (Principal Investigator)
A. Brown, Institution 2 (Co-Investigator)
A. Jones, Institution 3 (Co-Investigator)
Tier 1 or 2
-----page break-----
Text of abstract

The narrative portion of the project summary must not exceed one page when printed using standard letter-size (8.5 inch x 11 inch) paper with 1-inch margins (top, bottom, left and right) with font not smaller than 11-point font. To attach a Project Summary/Abstract, click “Add Attachment.”

If an application is recommended for award, the project summary will be used in preparing a public abstract about the award. Award abstracts and titles form a Government document that describes the project and justifies the expenditure of Federal funds in light of the DOE and SC mission statements at <https://energy.gov/mission> and <https://science.osti.gov/about/>.

- Do not include any proprietary or sensitive business information.
- DOE may use the abstract to prepare public reports about supported research.

DOE TITLE PAGE

(PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

The application narrative must begin with a title page that will not count toward the project narrative page limitation. The title page must include the following items:

- The Project Title:
- Applicant/Institution:
- Street Address/City/State/ZIP:
- Postal Address:
- Lead PI name, telephone number, email:
- Administrative Point of Contact name, telephone number, email:
- FOA Number (Include the FOA number printed on the cover of this FOA):
- DOE/SC Program Office:
- DOE/SC Program Office Technical Contact:
- PAMS LOI or Preproposal tracking number (if applicable):
- Tier 1 or 2, as described in Section I of this FOA:

Important Instructions to Submitting Institutions: SC requires that you create one single machine-readable PDF file that contains the DOE Title Page, project narrative, all required appendices, and other attachments. This single PDF file may not be scanned from a printed

document and must be attached in Field 8 on the Grants.gov form. This must be a plain PDF file consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders. The research narrative will be read by SC staff using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat. If combining multiple files into one research narrative, ensure that a PDF portfolio or binder is not created. If creating PDF files using any software other than Adobe Acrobat, please use a “Print to PDF” or equivalent process to ensure that all content is visible in the research narrative. Once a research narrative has been assembled, please submit the combined research narrative file through a “Print to PDF” or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat. Do not attach any of the appendices listed in this paragraph separately in any other field in Grants.gov. If you do, these additional attachments will not become part of the application in PAMS.

PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The project narrative **must not exceed a page limit of 25 pages**, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5 inch x 11 inch) paper with 1-inch margins (top, bottom, left, and right). The font of all main text must not be smaller than 11-point font. Merit reviewers will only consider the number of pages specified in the first sentence of this paragraph. This page limit does not apply to the Title Page, Budget Page(s), Budget Justification, biographical material, publications and references, appendices, and an optional table of content, each of which may have its own page limit defined later in this FOA.

Do not include any websites (URLs) that provide supplementary or additional information that constitutes a part of the application. Merit reviewers are not required to access websites; however, Internet publications in a list of references will be treated identically to print publications. See [Section VIII](#) for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The Project Narrative comprises the R&D plan for the project. It should contain enough background material in the Introduction, including a brief review of the relevant literature and any prior R&D in this area, to demonstrate sufficient knowledge of the state of the field. A major part of the narrative should be devoted to a description and justification of the proposed project, including details of the methods, development path, and targeted commercial impact. It should also include a timeline for the major activities/milestones of the proposed project and should indicate which project personnel will be responsible for which activities. There should be no ambiguity about which personnel will perform/lead particular parts of the project, and the time at which these activities will take place.

The following organization of the Project Narrative is suggested:

- **Background/Introduction:** Overview of the application, objectives, and proposed milestones
- **Scientific and Technical Viability:** See Section I for the suggested information to include in

this section.

- **Commercialization Viability:** See Section I for the suggested information to include in this section.
- **Business and Financial Viability:** See Section I for the suggested information to include in this section.
- **Community Benefits Plan - EJ and DEIA:** See Section I for the suggested information to include in this section.

Do not attach any of the requested appendices described below as files for fields 9, 10, 11, and 12 in Grants.gov. Follow the below instructions to include the information as appendices in the single, bundled project narrative file.

Biographical sketches and current and pending support may no longer be provided as attachments to a research narrative. These documents must be attached to the Research and Related Senior/Key Person Profile (Expanded) form in an application.

APPENDIX 1: BIBLIOGRAPHY & REFERENCES CITED

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. For research areas where there are routinely more than 10 coauthors of archival publications, you may use an abbreviated style such as the *Physical Review Letters* (PRL) convention for citations (listing only the first author). For example, your paper may be listed as, “A Really Important New Result,” A. Aardvark et. al. (MONGO Collaboration), PRL 999. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. Provide the Bibliography and References Cited information as an appendix to your project narrative.

- Do not attach a separate file
- This appendix will not count in the project narrative page limitation

APPENDIX 2: FACILITIES & OTHER RESOURCES

This information is used to assess the capability of the organizational resources, including subrecipient resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. For proposed investigations requiring access to experimental user facilities maintained by institutions other than the applicant, please provide a document from the facility manager confirming that the researchers will have access to the facility. Such documents, if they do not become letters of support or recommendation, may be printed on any letterhead. Please provide the Facility and Other Resource information as an

appendix to your project narrative.

- Do not attach a separate file
- This appendix will not count in the project narrative page limitation

APPENDIX 3: EQUIPMENT

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. Provide the Equipment information as an appendix to your project narrative.

- Do not attach a separate file
- This appendix will not count in the project narrative page limitation

APPENDIX 4: DATA MANAGEMENT PLAN

A Data Management Plan (DMP) as an appendix to the research narrative may be provided in lieu of the default option found in [Section VIII](#) of this FOA. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved and, at a minimum, describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

- This appendix should not exceed a page limit of two pages including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5 inch x 11 inch) paper with 1-inch margins (top, bottom, left, and right)
- Do not attach a separate file
- This appendix will not count in the project narrative page limitation

The standard requirements for a DMP may be found in [Section VIII](#) of this FOA.

APPENDIX 5: OTHER ATTACHMENT

If you need to elaborate on your responses to questions one through six (1-6) on the “Other Project Information” document, please provide the Other Attachment information as an appendix to your project narrative. Information not easily accessible to a reviewer may be included in this appendix, but do not use this appendix to circumvent the page limitations of the application. Reviewers are not required to consider information in this appendix.

- This appendix will not count in the project narrative page limitation.

REMINDERS REGARDING ALL APPENDICES

- **Follow the above instructions to include the information as appendices to the project narrative file**
- **These appendices will not count toward the project narrative’s page limitation**
- **Do not attach any appendices to fields 9, 10, 11, or 12**

3. Research and Related Senior/Key Person Profile (Expanded)

Complete the Research and Related Senior/Key Person Profile (Expanded) form in accordance with the instructions on the form and the following instructions. Complete this form before the

Budget form to populate data on the Budget form.

You must submit this information for the PI and all senior/key personnel who will be identified by name in Section A of the application's budget. List all other personnel who contribute in a substantive, meaningful way to the scientific development or execution of the project, whether or not salaries are requested. Consultants should be included in this "Senior/Key Person Profile (Expanded)" Form if they meet this definition. List individuals that meet the definition of senior/key regardless of their organization. Senior/key personnel must be aware that they are included in the application and must agree to perform the work if awarded. The form will pre-populate with the PI identified on the SF-424(R&R) form. For each senior/key person:

- Complete the required sections in their profile
- In the "credential" field, enter the person's PAMS username, if known
- Attach the person's biographical sketch, following in instructions in [Section VIII](#) for crafting a biographical sketch
- Attach the person's current and pending support, following the instructions in [Section VIII](#) for crafting current and pending support

The Senior/Key Person Profile (Expanded) form will support the PI and up to 99 additional senior/key personnel. On the addition of the 99th senior/key person, you will be presented with an option to upload an additional file with the required information for all other senior/key personnel.

For fixed-support TIAs, it is understood that the lead entity will subcontract (subaward) directly with any senior/key personnel who are at other institutions. Include their salaries in "Subawards/Consortium/Contractual Costs" in field F of the Research and Related Budget form.

4. Research and Related Budget

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. **You must complete a separate budget for each of 3 budget periods (18, 18, and 24 months, respectively, for a total of 60 months).** The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed if the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA.

Applicants requesting a fixed-support TIA are not subject to all the Federal cost principles and are only required to provide bottom-line numbers in each of sections (A-K) of the SF-424(R&R) Budget. Line-item details are not required for fixed-support TIAs. A fixed-support TIA should not account for or manage supplies (10 CFR 603.695).

Additional information is found in [Section VIII](#) of this FOA.

BUDGET JUSTIFICATION (FIELD L ON THE FORM)

For Expenditure-Based TIAs

Provide a justification that explains all costs proposed in the budget. The following items of advice are offered to assist you in developing a justification:

- Organize the justification by listing items in the same order as presented on the budget
- Ensure that the narrative matches the budget in dollar amounts and language
- Explain the line items. If costs are estimated, provide a basis for the estimate. Explain if costs are based on prior experience for similar activities. If a cost is based on the product of two numbers (such as an amount at a unit price), ensure that the math is correct.
- If including an escalation factor for future budget periods, explain the basis for the escalation factor.

Provide any other information you wish to submit to justify your budget request. Including items in the budget justification is not considered a form of cost-sharing: Provide the details of all personnel (key or other) who will be working on the award, regardless of their source(s) of compensation. Explain their source(s) of compensation if it is not from this award. Include the indirect cost rate agreement as a part of the budget justification.

For fixed-support TIAs

Applicants should provide a concise justification and basis for the total cost to complete each milestone.

All applicants shall attach a single budget justification file for the entire project period in field L. The file automatically carries over to each budget period.

Additional information is found in [Section VIII](#) of this FOA.

5. R&R Subaward Budget Attachment(s) Form

This section does not apply for applications selecting fixed-support TIAs as the award instrument. For applicants selecting TIAs, simply indicate the total anticipated “Subawards/Consortium/Contractual Costs” in field F of the Research and Related Budget form.

Budgets for Subawards: You must provide a separate R&R budget and budget justification for each subrecipient. Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and either email it to each subrecipient that is required to submit a separate budget or use the collaborative features of Workspace. After the subrecipient has either emailed its completed budget back to you or completed it within Workspace, attach it to one of the blocks provided on the form. Use up to 10 letters of the subrecipient’s name (plus.pdf) as the file name (e.g., ucla.pdf or energyres.pdf). Filenames must not exceed 50 characters.

If the project involves more subrecipients than there are places in the SUBAWARD BUDGET ATTACHMENT(S) FORM, the additional subaward budgets may be saved as PDF files and appended to the Budget Justification attached to Field L.

Applicants should consult their local information technology (“IT”) support resources for any

necessary assistance in converting the forms downloaded from Grants.gov into plain PDF files that can be combined into one non-Portfolio PDF file (the Budget Justification).

Ensure that any files received from subrecipients are the PDF files extracted from the SUBAWARD BUDGET ATTACHMENT(S) FORM. Errors will be created if a subrecipient sends a prime applicant a budget form that was not extracted from the application package.

Note: If an application proposes subawards to a DOE/NNSA National Laboratory, a federal agency, or another federal agency's FFRDC, the value of such proposed subawards may be deducted from any resulting award: Those classes of organizations may be paid directly by SC. However, the details of such proposed budgets are an essential for understanding and analyzing the proposed research.

If the budget for an application is comprised of discrete or separable projects or tasks, the SUBAWARD BUDGET ATTACHMENT(S) FORM allows you to identify a budget as belonging to either a "project" or a "subaward."

6. Project/Performance Site Location(s)

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2-digit state code followed by a dash and a 3-digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

7. Disclosure of Lobbying Activities (SF-LLL)

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the TIA, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

8. Identification of Merit Reviewer Conflicts

Provide a list of individuals who should not serve as merit reviewers of this application, following the instructions in [Section VIII](#) of this FOA. Attach this information to Field 12 of the Research and Related Other Project Information Form.

9. Summary of Required Forms/Files

Your application must include the following items:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
Identification of Merit Review Conflicts	File	Field 12
RESEARCH & RELATED Senior/Key Person Profile (Expanded)	Form	N/A
RESEARCH & RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field L
R&R SUBAWARD BUDGET ATTACHMENT(S) FORM (if applicable)	Form	N/A
Subaward Budget Justification (if applicable)	PDF	Field L of the subaward budget
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

E. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information (not for fixed-support TIAs)
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable
- Environmental Information

Applicants selecting expenditure-based TIAs that are not institutions of higher education, that request indirect costs, and that do not already have an Indirect Cost Rate Agreement with their Cognizant Federal Agency or documentation of rates accepted for estimating purposes by DOE or another Federal agency, are advised to begin preparing an Indirect Cost Rate Proposal for submission, upon request, to the DOE Contract Specialist/Grants Management Specialist who will evaluate your application if you are selected for award.

F. SUBMISSION DATES AND TIMES

1. Letter of Intent Due Date

N/A

2. Pre-application Due Date

The pre-application due date is printed on the cover of this FOA.

You are encouraged to submit your pre-application well before the deadline. Pre-applications may be submitted at any time between the publication of this FOA and the stated deadline.

3. Application Due Date

The application due date is printed on the cover of this FOA.

You are encouraged to transmit your application well before the deadline. Applications may be submitted at any time between the publication of this FOA and the stated deadline.

4. Late Submissions

Delays in submitting letters of intent, pre-applications, and applications may be unavoidable. DOE has accepted late submissions when applicants have been unable to make timely submissions because of widespread technological disruptions or significant natural disasters. DOE has made accommodations for incapacitating or life-threatening illnesses and for deaths of immediate family members. Other circumstances may or may not justify late submissions.

Unacceptable justifications include the following:

- Failure to begin submission process early enough
- Failure to provide sufficient time to complete the process
- Failure to understand the submission process
- Failure to understand the deadlines for submissions
- Failure to satisfy prerequisite registrations
- Unavailability of administrative personnel

You are responsible for beginning the submission process in sufficient time to accommodate reasonably foreseeable incidents, contingencies, and disruptions.

Applicants must contact the DOE/PM listed in this FOA to discuss the option of a late submission. Contacting the DOE/PM after the deadline may reduce the likelihood that a request will be granted.

DOE notes that not all requests for late submission will be approved.

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 600.13 to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA, including LOIs or pre-applications, has been submitted; (3) all mandatory requirements are satisfied; (4) the proposed project is responsive to the objectives of the FOA, and (5) the proposed project is not duplicative of programmatic work. Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review Criteria

Per the authorizing language for this program in the Energy Act of 2020, applications that are encouraged at the pre-application stage will be evaluated based upon its scientific, technical, and business merits, according to the following criteria and weighting.

Scientific and technical viability (30%)

- Readiness and credibility of the overall project plan
- Scientific and technical advantages/disadvantages of proposed FPP concept relative to other FPP concepts
- Recognition of major challenges and discussion of alternative strategies and risk mitigation
- Use of innovations to reduce cost and/or accelerate RD&D
- Prospect of delivering FPP preconceptual design and technology roadmap by 18 months after award
- Appropriateness/substantiveness of proposed S&T milestones to enable a successful FPP preliminary design review (PDR) as described in Table 5.1 of the NASEM report *Bringing Fusion to the U.S. Grid*
- Team expertise/capabilities (scientific, technological, engineering, procurement, construction, and operations) to deliver on project scope
- Adequacy of existing or proposed facilities
- Appropriateness of budget and staffing levels
- Adequacy of S&T management plan and organizational structure for overseeing multi-institutional/multi-disciplinary team and public-private partnerships as applicable
- Ability for team to evaluate success/failure and to reconfigure the project as needed

Commercialization viability (30%)

- Inherent commercialization potential of proposed FPP concept
- Appropriateness and plausibility of overall commercialization plan relative to proposed scope of work

- Adequate discussion of regulatory/licensing, waste disposition, FPP and FOAK capital costs, eventual LCOE, nonproliferation and nuclear security, and public engagement
- Inclusion of and/or access to the appropriate expertise and commercialization partners
- Appropriateness/substantiveness of the proposed business/financial milestones

Business and financial viability (30%)

- Appropriateness of lead company's estimated phased costs all the way to completion of an FPP
- Appropriateness of total amount of funds raised relative to planned path to an FPP and credibility of plans for future fundraising
- Appropriateness of business/financial leadership and partnerships commensurate with the ambition/objectives of the project

Community Benefits Plan: Energy justice (EJ) and Diversity, Equity, Inclusion, and Accessibility (DEIA) (10%)

- Potential long-term support of DOE's Justice40 policy priorities by the proposed commercialization pathway
- Fraction of total project cost devoted toward EJ/DEIA-centered activities
- Teaming opportunities for individuals from groups that are historically underrepresented in STEM, including minority-serving institutions (MSIs)
- Potential to contribute to the development of a diverse, skilled fusion workforce.
- Commitment to advance DEIA in the applicant team and organizations through evidence-based practices, with an emphasis on all aspects of DEIA and not only diversity
- Commitment to engage with communities to address their concerns regarding commercial fusion energy, including but not limited to environmental impact/burdens of the proposed fusion commercialization path
- Articulates how considerations of EJ and DOE Justice40 policy priorities may impact the project's R&D and FPP-design choices.

Reviewers will be selected based on relevant expertise and absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution. The authorizing language for this program in the Energy Act of 2020 specifies that reviewers shall include appropriate expertise from the private sector, the investment community, and experts in the science and engineering of fusion and plasma physics. Reviewers from DOE national laboratories and universities will be required to sign a statement of confidentiality. Reviewers from the private sector will be required to sign a non-disclosure agreement.

B. REVIEW AND SELECTION PROCESS

DOE / SC / FES anticipate holding a merit review panel of experts to evaluate applications submitted to this FOA.

1. Merit Review

Applications that pass the initial review will be subjected to a formal merit review and will be evaluated based on the criteria specified in Section V.A.2.

2. Program Policy Factors

The Selection Official may consider any of the following program policy factors in making the selection, listed in no order of significance:

- Availability of funds
- Relevance to program objectives
 - Enabling the construction and operation of an FPP in the 2030s
 - Significant improvement in fusion systems toward an FPP
 - Synergy and teaming between private and public partners
- Portfolio balance
 - S&T approach and diversity
 - Company stage
 - Commercialization prospects
 - Geographic diversity
- Broad EJ and DEIA considerations
- High leveraging of Federal funds (i.e., higher fraction of non-Federal contributions relative to the total project cost)
- Majority U.S.-owned, domestic lead entity.

3. Oral Presentation

Based on merit review of applications, DOE will select Finalists for an oral presentation. Applicants not selected as Finalists will receive a notification of their non-selection. Invited Finalists will meet with DOE representatives to present the key contents of their application and provide an opportunity for DOE to ask questions regarding the application. The information provided by applicants in the oral presentation contributes to DOE's selection decisions.

A maximum of two team members may jointly deliver the presentation, one of which must be the Principal Investigator. DOE recommends that the two selected presenters together are able to speak comprehensively to S&T, commercialization, business/financial, and EJ/DEIA aspects of the proposed project. Up to three additional team members may attend the oral presentation and answer questions as needed.

Finalists will be provided a minimum of 2 weeks to prepare for oral presentations. Supplemental questions from DOE may also be provided within this timeframe. Additional questions may arise during the Oral Presentation, and Finalists should be prepared to provide verbal responses to DOE. The Oral Presentation will follow this suggested schedule:

- Presenters give overview of the proposed project, including clarification questions only (60 minutes)
- Break (15 minutes)
- Open Q&A (60 minutes)

DOE will arrange to meet with Finalists in person at a mutually agreed upon location. Alternatively, DOE may invite Finalists to present to DOE via videoconference. DOE will not reimburse Finalists for travel and other expenses related to oral presentations, nor will these costs be eligible for reimbursement as pre-award costs.

4 Selection

The Selection Official will consider the findings of the merit review and may consider any of the DOE Program Policy Factors described above.

5. Review of Risk

Pursuant to National Security Presidential Memorandum 33, DOE will conduct a review of any potential risks posed by the applicant. Such review of risk will include:

- Quality of the application,
- Reports and findings from audits performed under 10 CFR 603, and
- Systems maintained under 2 CFR 180

DOE may make use of other publicly available information and the history of an applicant's performance under DOE or other Federal agency awards.

Applicants with no prior performance of DOE awards may be asked to provide information about their financial stability and or their ability to comply with the management standards. DOE may incorporate specific award conditions of a programmatic and/or administrative nature if an applicant exhibits one or more high-risk factors.

Further, DOE may conduct a review, through Government resources, of the applicant and project personnel with a connection to a foreign country. This includes, but is not limited to, (1) performance of work in, (2) travel to, and (3) awardee personnel's higher education in a foreign Country, as well as (4) partnerships with international collaborators.

The result(s) of any pre-award review of risk may supersede the results of merit review under 10 CFR 600.13, preventing DOE from selecting an application for award, reversing a selection for award, or requiring the disengagement of specific personnel. The results of any post-award review of risk may result in requiring the disengagement of specific personnel, the imposition of other requirements, or the termination of an award if DOE reasonably believes "that the project will not produce beneficial results commensurate with the expenditure of resources." 10 CFR 603.920(a)(2).

Pursuant to 10 CFR 600.22, the results of any pre-award review of risk are not appealable. Any pre-award decision to not select an application for award, reverse a selection for award, or require the disengagement of specific personnel will be made by the Selection Official or SC Program Official. Pursuant to 10 CFR 600.22 Disputes and appeals., the results of any post-award review of risk may be appealable. Any post-award decision to require the disengagement

of specific personnel, the imposition of other requirements, or the termination of an award will be made by the DOE Contracting Officer.

5. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to the following: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR 603; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

It is anticipated that the award selection will be completed by FY 2023. It is expected that awards will be made in Fiscal Year 2023.

Section VI – AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

Selected Applicants Notification: DOE will notify applicants selected for award negotiations. This notice of selection is not an authorization to begin performance.

Non-selected Notification: Organizations whose applications have not been selected will be informed as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

DOE will conduct award negotiations with the lead entity before an award is made. For awards to be made under TIAs, not all of the regulations and documents specified in this section are applicable. An Assistance Agreement issued by the DOE CO is the authorizing award document. It normally includes, either as an attachment or by reference, the following items: (1) Special Terms and Conditions, (2) Intellectual Property Provisions, (3) Federal Assistance Reporting Checklist and Instructions, (4) Budget Pages, (5) Negotiated Milestones and Schedule, (6) The Research Terms and Conditions, available at https://www.nsf.gov/pubs/policydocs/rtrtcoverlay_march17.pdf, and DOE Agency Specific Requirements, available at <https://www.nsf.gov/awards/managing/rtc.jsp>, (7) Application/proposal as approved by DOE, (8) National Policy Assurances to Be Incorporated as Award Terms in effect on date of award at <https://www.nsf.gov/awards/managing/rtc.jsp>.

For TIAs, the applicable program regulations and DOE Assistance Regulations are at 10 CFR 603, which incorporates [10 CFR part 600, subpart A – General](#), [10 CFR part 601 \(lobbying restrictions\)](#), [10 CFR part 606 \(debarment and suspension requirements\)](#), [10 CFR part 607 \(drug free workplace requirements\)](#), and 10 CFR 600 as referenced in 10 CFR 603. 10 CFR 603.125 Applicability of other parts of the DOE Assistance Regulations. The TIA must incorporate assurances of compliance with applicable requirements in Federal statutes, Executive Orders, or regulations (except for national policies that require certifications). 10 CFR 603.1010 Substantive issues.

TERMS AND CONDITIONS

Sample DOE Special Terms and Conditions are located at <https://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

The standard DOE financial assistance intellectual property provisions applicable to various types of recipients are located at: <https://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>

NATIONAL POLICY ASSURANCES

The National Policy Assurances To Be Incorporated As Award Terms are located at <https://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

The following additional policy provisions are applicable to this FOA. The full text of each provision is in [Section VIII](#) of this FOA and may be accessed by navigating to the hyperlinks below:

- [1. Evaluation and Administration by Non-Federal Personnel](#)
- [2. Government Right to Reject or Negotiate](#)
- [3. Intergovernmental Review](#)
- [4. Modifications](#)

Awards made under this FOA are subject to the following Administrative and National Policy Requirements. The full text of each provision is in [Section VIII](#) of this FOA and may be accessed by navigating to the hyperlinks below:

- [1. Administrative Requirements](#)
- [2. Availability of Funds](#)
- [3. Conference Spending \(February 2015\)](#)
- [4. Commitment of Public Funds](#)
- [5. Corporate Felony Conviction and Federal Tax Liability Representations \(March 2014\)](#)
- [6. Environmental, Safety and Health \(ES&H\) Performance of Work at DOE Facilities](#)
- [7. Federal, State, and Local Requirements](#)
- [8. Funding Restrictions](#)
- [9. National Environmental Policy Act \(NEPA\) Compliance](#)
- [10. Nondisclosure and Confidentiality Agreements Representations \(June 2015\)](#)
- [11. Notice Regarding Eligible/Ineligible Activities](#)
- [12. Prohibition on Discrimination and Harassment](#)
- [13. Prohibition on Lobbying Activity](#)
- [14. Proprietary Application Information](#)
- [15. Publications](#)
- [16. Registration Requirements](#)
- [17. Research Misconduct](#)
- [18. Rights in Technical Data](#)
- [19. Subaward and Executive Reporting](#)
- [20. Title to Subject Inventions](#)
- [21. U.S. Competitiveness](#)
- [22. Committee on Foreign Investment in the United States \(CFIUS\)](#)

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The standard checklist is available at <http://energy.gov/management/office-management/operational-management/financial->

[assistance/financial-assistance-forms](#) under Award Forms: Individual awards may impose different requirements.

D. REPORTING OF MATTERS RELATED TO RECIPIENT INTEGRITY AND PERFORMANCE (DECEMBER 2015)

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 USC 2313).

The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM.

DOE will consider any written comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under federal awards when completing the review of risk posed by applicants.

E. INTERIM CONFLICT OF INTEREST POLICY FOR FINANCIAL ASSISTANCE

1. Policy

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy) can be found at <https://www.energy.gov/management/pf-2022-17-department-energy-interim-conflict-interest-policy-requirements-financial>. This policy is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., technology investment agreement) and, through the implementation of this policy by the entity, to each Investigator who is planning to participate in, or is participating in, the project funded wholly or in part under the DOE financial assistance award. DOE's interim COI Policy establishes standards that provide a reasonable expectation that the design, conduct, and reporting of projects funded wholly or in part under DOE financial assistance awards will be free from bias resulting from financial conflicts of interest or organizational conflicts of interest. The applicant is subject to the requirements of the interim COI Policy and within each application for financial assistance, the applicant must certify that it is, or will be by the time of receiving any financial assistance award, compliant with all requirements in the interim COI Policy. The applicant must flow down the requirements of the interim COI Policy to any subrecipient non-Federal entities.

2. SC Implementation

SC only requires that unmanaged or unmanageable financial conflicts of interest be included in the FCOI report.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions relating to the Grants.gov registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@Grants.gov. DOE cannot answer these questions. Please only contact the Grants.gov help desk for questions related to Grants.gov.

For help with PAMS, click the “PAMS Help” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9:00 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference the FOA number on the cover of this Announcement. Please contact the PAMS help desk for technological issues with the PAMS system.

Questions regarding the specific program areas and technical requirements may be directed to the technical contacts listed for each program within the FOA or below. Please contact the program staff with all questions not directly related to the Grants.gov or PAMS systems.

B. AGENCY CONTACTS

Grants.gov Customer Support	800-518-4726 (toll-free) support@Grants.gov
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Program Manager Scientific Contact	Dr. John Mandrekas 301-903-4095 John.Mandrekas@science.doe.gov

Section VIII – SUPPLEMENTARY MATERIAL

A. HOW-TO GUIDES

1. How to Distinguish Between a New and Renewal Application

New Application: An application must be submitted as “new” in the following circumstances:

- When applying for funding to create a new research award that has not previously received DOE funding, including any funding for the current year,
- When applying for funding to support continued research from the same applicant institution as the current grant but with a significant change in fundamental nature of the research, or
- When applying for funding to support continued research supported by an existing DOE award but at a new applicant institution.

Renewal Application: A renewal application is appropriate when funds are requested for an award that has no changes in the following items:

- The recipient/applicant institution,
- The award’s senior leadership, and
- The fundamental nature of the award.

A change in an award’s PI does not necessarily require submission as a new application: The change in personnel must be considered in light of other changes.

Renewal applications compete for funds with all other peer-reviewed applications and must be developed as fully as though the applicant were applying for the first time. Renewal applications must be submitted by the same sponsoring institution as that holding the current award for which renewal funding is requested, and the proposed research topic must be logical scientific extensions of the research that has been performed in the current award.

2. How Federally Affiliated Organizations May Participate and Be Funded

VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORIES AND NON-DOE/NNSA FFRDCs

If a DOE/NNSA FFRDC is selected for award negotiation, the proposed work will be performed under the laboratory’s Management and Operating (M&O) contract through an SPP or CRADA with the lead for-profit entity. Note: The M&O contracts for DOE/NNSA Laboratories do not allow milestone payments. Thus, any negotiated SPP awards and CRADAs between for-profit entities and DOE/NNSA laboratories cannot include payments based on milestone completion. be performed under the laboratory’s Management and Operating (M&O) contract through an SPP or CRADA with the lead entity. Note: The M&O contracts for DOE/NNSA Laboratories do not allow milestone payments. Thus, any negotiated SPP awards and CRADAs between for-profit entities and DOE/NNSA laboratories cannot include payments based on milestone completion.

Funding for another Federal agency or its FFRDC would be by CRADA or other agreement as negotiated by the lead organization.

RESPONSIBILITY

The successful prime applicant/awardee (lead organization) will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and any team member, and/or subrecipient.

If an award is made to a DOE/NNSA National Laboratory, all Disputes and Claims will be resolved in accordance with the terms and conditions of the agreement between the DOE/NNSA National Laboratory and the lead organization or other subrecipient.

If an award is made to another Federal agency or its FFRDC contractor, all Disputes and Claims will be resolved in accordance with the terms and conditions of the agreement between the Federal agency or its FFRDC contractor and the lead organization or other subrecipient.

3. How Federally Affiliated Organizations May Apply

DOE/NNSA NATIONAL LABORATORIES

DOE/NNSA National Laboratories, if eligible either as a prime applicant or a proposed team member on another entity's application, should ensure that their cognizant DOE/NNSA Contracting Officer provides written authorization. This authorization should be submitted with the application as part of the Budget Justification for DOE/NNSA National Laboratory Contractor File. [This is not required for the National Energy Technology Laboratory because it is a Government Owned/Government Operated (GOGO) Laboratory.] **Please note that failure to provide this authorization may result in rejection of an application prior to merit review.** The following wording is acceptable for the authorization:

“Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory.”

(End of acceptable authorization)

- If written authorization from the cognizant DOE/NNSA Contracting Officer cannot be obtained by the submission deadline, provide a non-binding letter of interest/support from an appropriate official of the DOE/NNSA National Laboratory, e.g., the contractor Laboratory's liaison to Fusion Energy Sciences.
- The letter should acknowledge that approval from the cognizant DOE/NNSA Contracting Officer is required before commencement of work.
- The letter may be included in Appendix 5, Other Attachments.

NON-DOE/NNSA FFRDCs

Non-DOE/NNSA FFRDCs, if eligible either as a prime applicant or a proposed team member on another entity's application, should follow the following guidelines:

The prime applicant must obtain written authorization for non-DOE/NNSA FFRDC participation. The cognizant Contracting Officer for the Federal agency sponsoring the FFRDC contractor must authorize in writing the participation of the FFRDC contractor on the proposed project and this authorization should be submitted with the application. The written authorization must also contain a determination that the use of a FFRDC contractor is consistent with the contractor's authority under its award and does not place the FFRDC contractor in direct competition with the private sector, in accordance with FAR Part 17.5. **Please note that failure to provide this authorization may result in rejection of an application prior to merit review.** The following wording is acceptable for the authorization:

“Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the (insert agency) assigned programs at the laboratory. This laboratory is authorized to perform the work proposed in the application submitted under DOE Funding Opportunity Announcement <<Include the FOA number on the cover page>> by the following statutory authority (insert statute name, citation, and section).”

(End of acceptable authorization)

OTHER FEDERAL AGENCIES

Other Federal Agencies, if eligible either as a prime applicant or a proposed team member on another entity's application, must include in their budget justifications any specific statutory authorization (other than the Economy Act) that permits the agency to perform work for the lead for-profit entity or subrecipient or that authorizes the payment of certain costs by the lead for-profit entity or subrecipient.

4. How Consortia May be Used

INCORPORATED CONSORTIA

Incorporated consortia are eligible to apply for funding as a prime recipient (lead organization if for-profit) or subrecipient (team member) with a for-profit lead.

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE CO. There is no requirement that subawards be formalized into incorporated consortia.

UNINCORPORATED CONSORTIA

Unincorporated consortia (team arrangements) must designate a for-profit member of the consortium to serve as the prime recipient/consortium representative (lead organization). There is no requirement that subawards be formalized into unincorporated consortia.

Upon request, unincorporated consortia must provide the DOE CO with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortium's:

- Management structure
- Method of making payments to consortium members
- Means of ensuring and overseeing members' efforts on the project
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement

Note that a consortium is applied for in one application and results in one award with subawards to consortia members. Multi-institutional teams may, if permitted under this FOA, submit collaborative applications with each institution submitting its own application with an identical research narrative, resulting in multiple awards to the collaborating institutions.

5. How to Submit Letters of Intent

LOI is not required for this FOA.

6. How to Submit a Pre-Application

A pre-application is required for this FOA.

It is important that the pre-application be a single file with extension .pdf, .docx, or .doc. The filename must not exceed 50 characters. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a pre-application. All PIs and those submitting pre-applications on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.

Submit Your Pre-Application:

- Create your pre-application (called a preproposal in PAMS) outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.
- Log into PAMS and click the Proposals tab. Click the "View / Respond to Funding Opportunity Announcements" link and find the current announcement in the list. Click the "Actions/Views" link in the Options column next to this announcement to obtain a dropdown menu. Select "Submit Preproposal" from the dropdown.

- On the Submit Preproposal page, select the institution from which you are submitting this preproposal from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select one and only one PI per preproposal; to do so, click the “Select PI” button on the far-right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the preproposal. Save the preproposal for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Preproposals” for later editing.
- Enter a title for your preproposal
- Select the appropriate technical contact from the Program Manager dropdown
- To upload the preproposal file into PAMS, click the “Attach File” button at the far-right side of the screen. Click the “Browse” (or “Choose File” depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.
- At the bottom of the screen, click the “Submit to DOE” button to save and submit the preproposal to DOE
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the preproposal

You are encouraged to register for an account in PAMS at least a week in advance of the preproposal submission deadline so that there will be no delays with your submission.

WARNING: The PAMS website at <https://pamspublic.science.energy.gov> will permit you to edit a previously submitted pre-application in the time between your submission and the deadline. If you choose to edit, doing so will remove your previously submitted version from consideration. If you are still editing at the time of the deadline, you will not have a valid submission. Please pay attention to the deadline.

Do not attach pre-applications to Field 21 of the SF-424(R&R) form or letters of intent to Field 21 of the SF-424(R&R) form. Doing so will render your application unreadable.

7. How to Register and Submit an Application in Grants.gov

This section provides the application submission and receipt instructions for applications to SC. Please read the following instructions carefully and completely.

ELECTRONIC DELIVERY

SC is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. SC requires applicants to submit their applications online through Grants.gov.

HOW TO REGISTER TO APPLY THROUGH GRANTS.GOV

a. Instructions: Read the instructions below about registering to apply for SC funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

Organizations must have an active System for Award Management (SAM) registration which provides a Unique Entity Identifier (UEI), and Grants.gov account to apply for grants. If individual applicants (those submitting on their own behalf) are eligible to apply for this funding opportunity, they need only refer to steps 2 and 3 below.

Creating a Grants.gov account can be completed online in minutes, but SAM registration may take several weeks. Therefore, an organization's registration should be done in sufficient time to ensure it does not impact the entity's ability to meet required application submission deadlines.

Complete organization registration instructions can be found on Grants.gov here:
<https://www.Grants.gov/web/grants/applicants/organization-registration.html>

1) *Register with SAM:* All organizations applying online through Grants.gov must register with SAM at <https://www.sam.gov>. Failure to register with SAM will prevent your organization from applying through Grants.gov. SAM registration must be renewed annually. For more detailed instructions for registering with SAM, refer to: <https://www.grants.gov/web/grants/applicants/organization-registration.html>

2) *Create a Grants.gov Account:* The next step is to register an account with Grants.gov. Follow the on-screen instructions provided on the registration page

3) *Add a Profile to a Grants.gov Account:* A profile in Grants.gov corresponds to a single applicant organization the user represents (i.e., an applicant) or an individual applicant. If you work for or consult with multiple organizations and have a profile for each, you may log in to one Grants.gov account to access all of your applications. To add an organizational profile to your Grants.gov account, enter the UEI (Unique Entity Identifier) for the organization in the UEI field. If you are an individual applicant submitting on your own behalf, you do not need a UEI to add the profile. For more detailed instructions about creating a profile on Grants.gov, refer to: <https://www.Grants.gov/web/grants/applicants/registration/add-profile.html>

4) *EBiz POC Authorized Profile Roles:* After you register with Grants.gov and create an Organization Applicant Profile, the organization applicant's request for Grants.gov roles and access is sent to the Electronic Business Point of Contact (EBiz POC). The EBiz

POC will then log in to Grants.gov and authorize the appropriate roles, which may include the Authorized Organization Representative (AOR) role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been assigned the AOR role. For more detailed instructions about creating a profile on Grants.gov, refer to: <https://www.Grants.gov/web/grants/applicants/registration/authorize-roles.html>

5) *Track Role Status*: To track your role request, refer to: <https://www.Grants.gov/web/grants/applicants/registration/track-role-status.html>

b. *Electronic Signature*: When applications are submitted through Grants.gov, the name of the organization applicant with the AOR role that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC **must** authorize people who are able to make legally binding commitments on behalf of the organization as a user with the AOR role; **this step is often missed and it is crucial for valid and timely submissions.**

HOW TO SUBMIT AN APPLICATION TO SC VIA GRANTS.GOV

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of an applicant team may simultaneously access and edit different webforms within an application. For each FOA, you can create individual instances of a workspace.

Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to:

<https://www.Grants.gov/web/grants/applicants/apply-for-grants.html>

- 1) Create a Workspace: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.
- 2) Complete a Workspace: Add participants to the workspace to work on the application together, complete all the required forms online or by downloading PDF versions, and check for errors before submission. The Workspace progress bar will display the state of your application process as you apply. As you apply using Workspace, you may click the blue question mark icon near the upper-right corner of each page to access context-sensitive help.

a. Adobe Reader: If you decide not to apply by filling out webforms you can download individual PDF forms in Workspace so that they will appear similar to other Standard forms. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at:

<https://www.Grants.gov/web/grants/applicants/adobe-software-compatibility.html>

b. Mandatory Fields in Forms: In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.

c. Complete SF-424 Fields First: These forms are designed to fill in common required fields across other forms, such as the applicant's name, address, and SAM UEI. Once it is completed, the information will transfer to the other forms.

3) Submit a Workspace: An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package *at least 24-48 hours prior to the close date* to provide you with time to correct any potential technical issues that may disrupt the application submission.

4) Track a Workspace: After successfully submitting a workspace package, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the package. The number will be listed on the Confirmation page that is generated after submission.

For additional training resources, including video tutorials, refer to:

<https://www.Grants.gov/web/grants/applicants/applicant-training.html>

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1-800-518-4726 and email at support@Grants.gov. For questions related to the specific funding opportunity, contact the number listed in the application package of the funding opportunity to which you are applying.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist SC with tracking your issue and understanding background information on the issue.

TIMELY RECEIPT REQUIREMENTS AND PROOF OF TIMELY SUBMISSION

Proof of timely submission is automatically recorded by Grants.gov. An electronic date/time stamp is generated within the system when the application is successfully received by Grants.gov. The applicant AOR will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. Applicant AORs will also receive the official date/time stamp and Grants.gov Tracking number in an email serving as proof of their timely submission.

When SC successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgment of receipt of the application to the email address of the applicant with the AOR role. Again, proof of timely submission shall be the official date and time that Grants.gov receives your application. Applications received by Grants.gov after the established due date for the program will be considered late and may not be considered for funding by SC.

Applicants using unreliable internet connections should be aware that the process of completing the Workspace can take some time. Therefore, applicants should allow enough time to prepare and submit the application before the package closing date.

Grants.gov will provide either an error or a successfully received submission message in the form of an email sent to the applicant with the AOR role attempting to submit the application.

If you do not promptly receive an email from Grants.gov with an agency tracking number, indicating receipt of the application by SC, please contact the Grants.gov Helpdesk at 800-518-4726 (toll-free) or support@Grants.gov immediately. SC will have no records of your attempted submission without the second email from Grants.gov.

8. How to Prepare an Application

APPLICATION PREPARATION

You must submit the application through Grants.gov at <https://www.Grants.gov/>, using either the online webforms or downloaded forms. (Additional instructions are provided in [7., above.](#))

You are required to use the compatible version of Adobe Reader software to complete a [Grants.gov](#) Adobe application package. To ensure you have the [Grants.gov](#) compatible version of Adobe Reader, visit the software compatibility page at <https://www.Grants.gov/web/grants/applicants/adobe-software-compatibility.html>.

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below.

Files that are attached to the forms must be PDF files unless otherwise specified in this FOA. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders.

Please note the following restrictions that apply to the names of all files attached to your application:

- Please limit file names to 50 or fewer characters
- Do not attach any documents with the same name. All attachments must have a unique name.
- Please use only the following characters when naming your attachments: A-Z, a-z, 0-9, underscore, hyphen, space, period, parenthesis, curly braces, square brackets, ampersand, tilde, exclamation point, comma, semi colon, apostrophe, at sign, number sign, dollar sign, percent sign, plus sign, and equal sign. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing.

RESUBMISSION OF APPLICATIONS

Applications submitted under this FOA may be withdrawn from consideration by using the

PAMS website at <https://pamspublic.science.energy.gov>. Applications may be withdrawn at any time between when the applicant submits the application and when DOE makes the application available to merit reviewers. Such withdrawals take effect immediately and cannot be reversed. Please exercise due caution. After the application is made available to merit reviewers, the applicant may contact the DOE program office identified in this FOA to request that it be withdrawn.

After an application is withdrawn, it may be resubmitted, if this FOA is still open for the submission of applications. Such resubmissions will only count as one submission if this FOA restricts the number of applications from an applicant.

Note that there may be a delay between the application's submission in Grants.gov and when it is available to be withdrawn in PAMS. SC will usually consider the last submission, according to its Grants.gov timestamp, to be the intended version. Please consult with your program manager to resolve any confusion about which version of an application should be considered.

IMPROPER CONTENTS OF APPLICATIONS

Applications submitted under this FOA will be stored in controlled-access systems, but they may be made publicly available if an award is made. As such, it is critical that applicants follow these guidelines:

- Do not include information subject to any legal restriction on its open distribution, whether classified, export control, or unclassified controlled nuclear information
- Do not include sensitive and protected personally identifiable information, including social security numbers, birthdates, citizenship, marital status, or home addresses. Pay particular attention to the content of biographical sketches and curriculum vitae
- Do not include letters of support from Federal officials. Do not include letters of support on Federal letterhead. Letters that are not letters of support (such as letters confirming access to sites, facilities, equipment, or data; or letters from cognizant Contracting Officers) may be on Federal letterhead
- Clearly mark all proprietary or trade-secret information

CHANGE OF AWARDEE INSTITUTION

If an awardee chooses to relinquish an award made under this FOA to permit the transfer of the award to a new institution, the new institution must apply under the then-available SC "annual" or "open" FOA.

9. How to Prepare a Biographical Sketch

A biographical sketch is to provide information that can be used by reviewers to evaluate the PI's potential for leadership within the scientific community. Examples of information of interest are invited and/or public lectures, awards received, scientific program committees, conference or workshop organization, professional society activities, special international or industrial partnerships, reviewing or editorship activities, or other scientific leadership experiences.

SC requires the use of the format approved by the National Science Foundation (NSF), which

may be generated by the Science Experts Network Curriculum Vitae (SciENcv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf>. If an interagency common format for a biographical sketch has been promulgated, that format must be used in an application. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

The biographical information (curriculum vitae) must include the following items within its page limit:

- **Education and Training:** Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year
- **Research and/or Professional Experience:** Beginning with the current position, list professional/academic positions in chronological order with a brief description. List all current academic, professional or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether or not remuneration is received, and, whether full-time, part-time, or voluntary.
- **Publications:** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights and software systems developed may be provided in addition to or substituted for publications. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than 10 authors.
- **Synergistic Activities:** List no more than five professional and/or scholarly activities related to the effort proposed

Requested information may be appended to a biographical sketch, whether produced from a fillable PDF or in SciENcv.

Do not attach a listing of individuals who should not be used as merit reviewers: This information is no longer collected as part of a biographical sketch.

SC strongly recommends the use of SciENcv to reduce administrative burden by allowing the use of digital persistent identifiers, including the Open Researcher and Contributor ID (ORCID). Biographical sketches must be attached to the Research and Related Senior/Key Person Profile (Expanded) form in an application.

Personally Identifiable Information (PII): Do not include sensitive and protected personally identifiable information including social security numbers, birthdates, citizenship, marital status, or home addresses. Do not include information that a merit reviewer should not make use of.

10. How to Prepare a List of Individuals Who Should Not Serve as Reviewers

To assist in identifying individuals who should not serve as merit reviews, provide the following information for each and every senior/key person who is planned to be or is identified in Section

A of the R&R Budget for the applicant and any proposed subrecipients:

- Advisees (graduate students or postdocs) of the senior/key person
- Advisors of the senior/key person while a graduate student or a postdoc
- Close associates of the senior/key person over the past 48 months
- Co-authors of the senior/key person over the past 48 months
- Co-editors of the senior/key person over the past 48 months
- Co-investigators of the senior/key person over the past 48 months
- Collaborators of the senior/key person over the past 48 months

Do not identify any personnel at the applicant institution or any proposed subrecipient or team institution: Those personnel are prohibited from serving as merit reviewers.

Large collaborations of 10 or more researchers do not require that all collaborators be identified: rather, only list the researchers with whom the senior/key person actually collaborated.

For all identified individuals, provide the following information:

- The senior/key person to whom the individual was an advisee, advisor, close associate, co-author, co-editor, co-investigator, or collaborator, identified by first name and last name
- The individual's first (given) name
- The individual's last (family) name
- The individual's Open Researcher and Contributor ID (ORCID), if known
- The individual's institutional affiliation spelling out acronyms (For joint appointments, separate each institution with a slash ("/"). Do not list departmental affiliations.)
- The reason for listing the individual (advisee, advisor, close associate, co-author, co-editor, co-investigator, collaborator)
- The year when the individual last was a close associate, co-author, co-editor, co-investigator, or collaborator

You may also provide a list of all senior/key personnel who are planned to be or are identified in Section A of the R&R Budget for the applicant and any proposed subrecipients.

The lists do not need to be sorted in any method.

The lists must be submitted in tabular format, preferably as Microsoft Excel (.xls or .xlsx) files.

For your convenience, a template is available at <https://science.osti.gov/grants/Policy-and-Guidance/Agreement-Forms>. The template may also be posted with this FOA in Grants.gov. If using the template:

- Do not add tabs to the spreadsheet
- Do not merge the existing tabs
- Do not remove headers
- Fill out the requested headers on both tabs with the same information
- Ensure that given and family names are presented in the correct columns

11. How to Prepare Current and Pending Support

WARNING: These instructions have been significantly revised to require disclosure of a variety of potential conflicts of interest or commitment, including participation in foreign government-sponsored talent recruitment programs.

Current and Pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. The PI and each senior/key person at the prime applicant and any proposed subaward must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. All foreign government-sponsored talent recruitment programs must be identified in current and pending support.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vitae (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.pdf>. If an interagency common format for current and pending support has been promulgated, that format must be used in an application. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

For every activity, list the following items:

- The sponsor of the activity or the source of funding
- The award or other identifying number
- The title of the award or activity. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research
- The total cost or value of the award or activity, including direct and indirect costs. For pending proposals, provide the total amount of requested funding
- The award period (Award Start Date through End Date)
- The "person-months" of effort per year being dedicated to the award or activity

If required to identify overlap, duplication of effort, or synergistic efforts, append a description of the other award or activity to the current and pending support.

Requested information may be appended to current and pending support, whether produced from a fillable PDF or in SciENCv.

SC strongly recommends the use of SciENCv to reduce administrative burden by allowing the use of digital persistent identifiers, including the Open Researcher and Contributor ID (ORCID). Current and pending support must be attached to the Research and Related Senior/Key Person Profile (Expanded) form in an application.

Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE.

12. How to Prepare a Data Management Plan

All applicants must select one of the following options for their Data Management Plan (DMP):

Option 1)

The Option 1 DMP is: “It is anticipated that all generated digital data will be protected as Protected Data and therefore will not be publicly shared during the applicable protection period of the Protected Data. If any data generated under this award are published, an effort will be made to also release any related digital data that is not Protected Data.” Applications that select Option 1 must not include publication costs in their budget, as this implies that data will be shared publicly.

Please note that if you do not include a DMP with your application, Option 1 for the DMP will be assumed for your application. However, if you plan to publicly disclose generated digital data, you must provide a DMP under Option 2.

Option 2)

If you plan to publicly disclose technical data during the data protection period or, for data not expected to be asserted as protected rights data, please submit a DMP, following the following instructions.

In general, a DMP should address the following requirements:

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.
2. DMPs should provide a plan for making all research data displayed in 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 research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (<https://science.osti.gov/funding-opportunities/digital-data-management>). This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.
3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. DMPs that explicitly or implicitly commit data management 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 at SC User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found at <https://science.osti.gov/user-facilities/>.

4. DMPs must protect confidentiality, personal privacy, PII, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise, be consistent with all applicable laws, and regulations. There is no requirement to share proprietary data.

DMPs will be reviewed as part of the overall SC research proposal merit review process. Applicants are encouraged to consult the SC website for further information and suggestions for how to structure a DMP: <https://science.osti.gov/funding-opportunities/digital-data-management>

13. How to Prepare a Research and Related Budget and Justification

The following advice will improve the accuracy of your budget request:

- Funds requested for personnel (senior, key, and other) must be justified as the product of their effort on the project and their institutional base salary
- Funds requested for fringe benefits must be calculated as the product of the requested salary and, if present, the negotiated fringe benefit rate contained in an institution’s negotiated indirect cost rate agreement
- Funds requested for indirect costs must be calculated using the correct indirect cost base and the negotiated indirect cost rate
- You are encouraged to include the rate agreement used in preparing a budget as a part of the budget justification

Do not prepare a budget justification using the expired DOE form F4260.1.

If you are proposing indirect costs and do not already have an Indirect Cost Rate Agreement with your Cognizant Federal Agency or documentation of rates accepted for estimating purposes by DOE or another Federal agency, it is recommended that you begin preparing an Indirect Cost Rate Proposal to be submitted, upon request, to the DOE CO will evaluate your application if you are selected for award.

For your convenience in preparing an Indirect Cost Rate proposal, a link to applicant resources, including indirect rate model templates, has been provided below:

<https://science.osti.gov/sbir/applicant-resources/grant-application/>.

Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary, the number of months that person will be allocated to the project, requested salary, fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the
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	need for requested personnel. Within the justification, explain the fringe benefit rate used if it is not the standard faculty rate.
Section B Other Personnel	List personnel, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel. Within the justification, provide the number of positions being filled in each category of other personnel.
Section C Equipment	For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected service life of more than one year, unless a different threshold is specified in a negotiated Facilities and Administrative Cost Rate. (Note that this designation applies for proposal budgeting only and differs from the DOE definition of capital equipment.) List each item of equipment separately and justify each in the budget justification section. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research. For TIAs and treatment of acquisition costs for equipment, see 10 CFR § 603.680 Purchase of real property and equipment by for-profit firms.
Section D Travel	For purposes of this section only, travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip's destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel. Within the budget justification, detail the number of personnel planning to travel and the estimated per-traveler cost for each trip.
Section E Participant/Trainee Support Costs	If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and postgraduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses.

	<p>Indicate the basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis).</p>
<p>Section F Other Direct Costs</p>	<ul style="list-style-type: none"> • Materials and Supplies: Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under “Equipment”). Categories less than \$1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis). <p>A fixed-support TIA should not account for or manage supplies. 10 CFR § 603.695 Requirements for supplies.</p> <ul style="list-style-type: none"> • Publication Costs: Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis). • Consultant Services: Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, travel costs, and total estimated costs. Indicate the basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis). • ADP/Computer Services: Enter total funds requested for ADP/Computer Services. Cloud computing costs must be included under this item. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. Indicate the basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis). • Subawards/Consortium/Contractual Costs: Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details. • Equipment or Facility Rental/User Fees: Enter total funds requested for Equipment or Facility Rental/User Fees. In the budget justification, identify each rental/user fee and justify. Indicate the

	<p>basis for the cost estimate (quotes from vendors or suppliers, experience of similar items, or some other basis).</p> <ul style="list-style-type: none"> • Alterations and Renovations: Enter total funds requested for Alterations and Renovations. In the budget justification, itemize by category and justify the costs of alterations and renovations, including repairs, painting, removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs. • Other: Add text to describe any other Direct Costs not requested above. Enter costs associated with “Other” item(s). Use the budget justification to further itemize and justify.
Section G Direct Costs	This represents Total Direct Costs (Sections A through F).
Section H Other Indirect Costs	Enter the Indirect Cost information, including the rates and bases being used, for each field. Only four general categories of indirect costs are allowed/requested on this form, so please consolidate if needed. Include the cognizant Federal agency and contact information if using a negotiated rate agreement. Within the budget justification, explain the use of multiple rates, if multiple rates are used.
Section I Total Direct and Indirect Costs	This is the total of Sections G and H.

14. How to Register in PAMS

After you submit your application through Grants.gov, the application will automatically transfer into the Portfolio Analysis and Management System (PAMS) for processing by the DOE SC. PAMS is available at <https://pamspublic.science.energy.gov>.

You will want to “register to” your application: a process of linking yourself to the application after it has been submitted through Grants.gov and processed by DOE.

You must register in PAMS to submit a pre-application or a LOI.

Notifications sent from the PAMS system will come from the PAMS email address <PAMS.Autoreply@science.doe.gov>. Please make sure your email server/software allows delivery of emails from the PAMS email address to yours.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

CREATE PAMS ACCOUNT:

To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.

- Click the “No, I have never had an account” link and then the “Create Account” button.

- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an SC merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

REGISTER TO YOUR INSTITUTION:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

For help with PAMS, click the “PAMS Help” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference the FOA number printed on the cover page.

15. How to View Applications in PAMS

Each Grants.gov application submitted to the DOE SC automatically transfers into PAMS and is subsequently assigned to a program manager. At the time of program manager assignment, the three people listed on the SF-424 (R&R) cover page will receive an email with the subject line, “Receipt of Proposal 0000xxxxxx by the DOE Office of Science.” These three people are the PI (Block 14), Authorized Representative (Block 19), and Point of Contact (Block 5). In PAMS notation, applications are known as proposals, the PI is known as the PI, the Authorized Representative is known as the Sponsored Research Officer/Business Officer/Administrative Officer (SRO/BO/AO), and the Point of Contact is known as the POC.

There will be a period of time between the application’s receipt at Grants.gov and its assignment to a DOE SC program manager. Program managers are typically assigned two weeks after applications are due at Grants.gov: please refrain from attempting to view the proposal in PAMS until you receive an email providing the assignment of a program manager.

Once the email is sent, the PI, SRO/BO/PO, and POC will each be able to view the submitted proposal in PAMS. Viewing the proposal is optional.

Following are two sets of instructions for viewing the submitted proposal, one for individuals who already have PAMS accounts and one for those who do not.

If you already have a PAMS account, follow these instructions:

1. Log in to PAMS at <https://pamspublic.science.energy.gov/>.
2. Click the “Proposals” tab and click “Access Previously Submitted Grants.gov Proposal.”
3. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, “Receipt of Proposal ...”.
 - Email (as entered in Grants.gov application): Enter your email address as it appears on the SF424(R&R) Cover Page.
 - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF-424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
4. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The Grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal. Note that the steps above will work only for proposals submitted to the DOE SC since May 2012.

If you do not already have a PAMS account, follow these instructions:

1. To register, click the “Create New PAMS Account” link on the website

<https://pamspublic.science.energy.gov/>.

2. Click the “No, I have never had an account” link and then the “Create Account” button.
3. You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
4. On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
5. Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
6. You will be taken to the Register to Institution page. Select the link labeled, “Option 1: My institution has submitted a proposal in Grants.gov. I am here to register as an SRO, PI, or POC (Sponsored Research Officer, Principal Investigator, or Point of Contact).”
7. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, “Receipt of Proposal ...”.
 - Email (as entered in Grants.gov proposal): Enter your email address as it appears on the SF424(R&R) Cover Page.
 - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF-424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
8. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The Grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal.

If you were listed as the PI on a prior submission but you have not previously created an account, you may already be listed in PAMS. If this is the case, you will be taken to the PAMS home page after agreeing to the Rules of Behavior. If that happens, follow the instructions listed above under “If you already have a PAMS account...” to access your Grants.gov proposal.

16. How to Register in Other Systems Before Submitting an Application

SYSTEMS TO REGISTER IN

Applicants must complete a series of registrations and enrollments to submit applications in response to this FOA. Applicants not currently registered with SAM and Grants.gov should allow **at least four weeks** to complete these requirements.

You should start the process as soon as possible.

You may not be able to use your preferred Internet browser: Each system has its own requirements.

Applicants must register with SAM at <https://www.sam.gov/> and obtain a Unique Entity Identifier (UEI). Assistance is available at <https://sam.gov/content/help>.

Applicants must provide a Taxpayer Identification Number (TIN) to complete their registration in www.SAM.gov. An applicant's TIN is an EIN assigned by the Internal Revenue Service (IRS). In limited circumstances, a Social Security Number (SSN) assigned by the Social Security Administration (SSA) may be used as a TIN. You may obtain an EIN from the IRS at <https://www.irs.gov/businesses/small-businesses-self-employed/apply-for-an-employer-identification-number-ein-online>.

Do not use a SSN as a TIN.

Obtain a TIN from the IRS using the website listed above.

Applicants must register with FedConnect at www.FedConnect.net. The full, binding version of assistance agreements will be posted to FedConnect.

Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.fsr.gov>. This registration must be completed before an award may be made: you are advised to register while preparing your application.

REGISTERING IN GRANTS.GOV

Applicants must register with Grants.gov, following the instructions at <https://www.Grants.gov/web/grants/applicants/registration.html> and described above.

WHERE TO SUBMIT AN APPLICATION

You must submit the application through Grants.gov at www.Grants.gov, using either the online webforms or downloaded forms, or a system-to-system service

Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@Grants.gov.

Please ensure that you have read the applicable instructions, guides, help notices, frequently asked questions, and other forms of technical support on Grants.gov.

DOE SC PORTFOLIO ANALYSIS AND MANAGEMENT SYSTEM (PAMS)

Applicants must register in the Portfolio Analysis and Management System (PAMS) to submit letters of intent and pre-applications, to view merit reviewer comments, or to take a number of post-award actions.

B. POLICY PROVISIONS

1. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign a conflict-of-interest agreement and a certificate of confidentiality prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

2. Government Right to Reject or Negotiate

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

3. Intergovernmental Review

This program is not subject to Executive Order 12372 Intergovernmental Review of Federal Programs.

4. Modifications

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an FOA message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other FOAs. More information is available at www.FedConnect.net.

C. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE TIAs are contained in 10 CFR 603 Technology Investment Agreements.

2. Availability of Funds

Funds are not presently available for this award. The Government's obligation under this award is contingent upon the availability of appropriated funds from which payment for award purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the DOE CO for this award and until the awardee receives notice of such availability, to be confirmed in writing by the DOE CO.

3. Conference Spending (February 2015)

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the instrument was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed \$20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

4. Commitment of Public Funds

(a) A DOE financial assistance award is valid only if it is in writing and is signed, either in writing or electronically, by a DOE CO.

(b) Recipients are free to accept or reject the award. A request to draw down DOE funds constitutes the Recipient's acceptance of the terms and conditions of this Award.

5. Corporate Felony Conviction and Federal Tax Liability Representations (March 2014)

In submitting an application in response to this FOA the Applicant represents that:

- It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months,
- It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

- A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

6. Environmental, Safety and Health (ES&H) Performance of Work at DOE Facilities

With respect to the performance of any portion of the work under this award which is performed at a DOE-owned or controlled site, the recipient agrees to comply with all state and Federal ES&H regulations, and with all other ES&H requirements of the operator of such site.

Prior to the performance on any work at a DOE-owned or controlled site, the recipient shall contact the site facility manager for information on DOE and site-specific ES&H requirements.

The recipient shall apply this provision to all subrecipients at any tier.

7. Federal, State, and Local Requirements

With respect to the performance of any portion of the work under this award, the recipient agrees to comply with all applicable local, state, and Federal ES&H regulations. The recipient shall apply this provision to all sub awardees at any tier.

8. Funding Restrictions

Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

Cost Principles:

For expenditure-based TIAs, costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles.

For fixed-support TIAs, milestone payments should be associated with the well-defined, observable, and verifiable technical outcomes. Fixed-support TIAs need not:

- (a) Specify minimum standards for the recipient's financial management system;
 - (b) Specify cost principles or standards stating the types of costs the recipient may charge to the project;
 - (c) Provide for financial audits by Federal auditors or independent public accountants of the recipient's books and records;
 - (d) Set minimum standards for the recipient's purchasing system; or
 - (e) Require the recipient to prepare financial reports for submission to the Federal Government.
- 10 CFR 603.315 Advantages of a fixed-support TIA.

For expenditure-based TIAs, an applicant is expected to apply the Government cost principles in 48 CFR part 31 if it currently performs under an expenditure-based Federal procurement contract(s) or assistance award(s) (other than a TIA) and therefore has existing systems for

identifying allowable costs under those principles. If there are programmatic or business reasons to do otherwise, the CO may grant an exception from this requirement and use alternative standards as long as the alternative satisfies the conditions described for applicants not currently performing under an expenditure-based Federal procurement contract(s) or assistance award(s). 10 CFR § 603.625 Cost principles or standards applicable to for-profit **participants**.

If an applicant under an expenditure-based TIA does not currently perform under an expenditure-based Federal procurement contract(s) or assistance award(s) (other than a TIA), the applicant should propose, and the CO may agree, to establish alternative standards in the agreement as long as that alternative provides, as a minimum, that Federal funds and funds counted as recipients' cost sharing will be used only for costs that:

- (1) A reasonable and prudent person would incur in carrying out the RD&D project contemplated by the agreement. Generally, elements of cost that appropriately are charged are those identified with RD&D activities under the Generally Accepted Accounting Principles (see Statement of Financial Accounting Standards Number 2, "Accounting for Research and Development Costs," October 1974). Moreover, costs must be allocated to DOE and other projects in accordance with the relative benefits the projects receive. Costs charged to DOE projects must be given consistent treatment with costs allocated to the participants' other RD&D activities (e.g., activities supported by the participants themselves or by non-Federal sponsors).
- (2) Are consistent with the purposes stated in the governing Congressional authorizations and appropriations. The CO is responsible for ensuring that provisions in the award document address any requirements that result from authorizations and appropriations. **10 CFR § 603.625 Cost principles or standards applicable to for-profit participants.**

For all awards, a recipient shall be responsible for all costs until milestones are achieved, or reimbursable expenses are reviewed and verified by the Department. 41 U.S.C. § 18645(i)(5)(A).

Fee or profit:

Recipients are unable to receive fee or profit. The prohibition against fee or profit extends to all performers of the project, including any subawards for substantive program performance, but it does not preclude participants' or subrecipients' payment of reasonable fee or profit when making purchases from suppliers of goods (e.g., supplies and equipment) or services needed to carry out the RD&D. 10 CFR § 603.230 Fee or profit (TIAs).

For expenditure-based TIA, pre-award costs, as long as they are otherwise allowable costs of the project, may be charged to an expenditure-based TIA only with the specific approval of the CO. 10 CFR § 603.830 Pre-award costs.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

9. National Environmental Policy Act (NEPA) Compliance

If question 4.a. on the "Research and Related Other Project Information" document indicates

“potential impact on the environment”, or if DOE’s own review indicates it, DOE may ask the applicant to provide additional information on those impacts in order to prepare an environmental critique/synopsis per 10 CFR 1021.216. Note that this pre-award environmental critique/synopsis process would be separate from the preparation of a NEPA document such as an environmental impact statement (EIS) or an environmental assessment (EA). If DOE determines the latter documentation is necessary, this process needs to be completed, funded by and with the participation of the awardee, prior to them taking any action on the proposed project that could have adverse environmental effects or that could limit the choice of reasonable alternatives. Note that in most cases, even when “Potential Impact to the Environment” is checked “Yes,” preparation of such NEPA documents is rarely necessary, but DOE has the expectation that the Applicant will disclose the potential, which would serve to initiate dialog with DOE if necessary. The inability to satisfy the NEPA requirements after an award would result in cancellation of the award.

10. Nondisclosure and Confidentiality Agreements Representations (June 2015)

In submitting an application in response to this FOA the Applicant represents that:

(1) It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(2) It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:

a. *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”*

b. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

c. Notwithstanding provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the

Department of Justice, that are essential to reporting a substantial violation of law.

11. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

12. Prohibition on Discrimination and Harassment

All people conducting, supporting, or participating in scientific research under this award must be able to do so on the basis of their abilities and without any unnecessary barriers. Recipients of awards resulting from this FOA are prohibited from engaging in discrimination on any basis prohibited by law, including harassment (sexual or non-sexual) as contained in 10 CFR 1040, 1041, and 1042.

Recipients may contact the DOE's Office of Civil Rights for technical assistance in meeting their institutional requirements under these regulations, including assistance in addressing complaints of discrimination or harassment (<https://www.energy.gov/diversity/title-ix>). The United States Equal Employment Opportunity Commission also makes a number of resources available at <https://www.eeoc.gov/eeoc/publications/index.cfm> to ensure that employees may perform their work without hindrance. Graduate students and post-doctoral researchers are understood to have a dual role as both trainees and employees.

13. Prohibition on Lobbying Activity

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 USC 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

14. Proprietary Application Information

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of any document included in the application that contains such proprietary information and specifies the pages of the document which are to be restricted:

“The data contained in pages _____ of this document have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose

the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests are not released to persons outside the Government, except for purposes of review and evaluation.”

15. Publications

The recipient is strongly encouraged to publish or otherwise make publicly available new scientific or engineering principles resulting from work conducted under any award resulting from this FOA that do not reveal protected information of the team. Publications and other methods of public communication describing any work based on or developed under an award resulting from this FOA must contain an acknowledgment of SC support. The format for such acknowledgments is provided at <https://science.osti.gov/funding-opportunities/acknowledgements/>. The author's copy of any peer-reviewed manuscript accepted for publication must be announced to DOE's Office of Scientific and Technical Information (OSTI) and made publicly available in accordance with the instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements.

16. Registration Requirements

Prime awardees must keep their data in SAM current at www.SAM.gov. Subrecipients at all tiers must obtain UEI numbers and provide the UEI to the prime awardee before the subaward can be issued.

17. Research Misconduct

Scientific discoveries can only take place when scientific research is conducted in a fair, transparent, and honestly reported manner. Any form of dishonesty—whether plagiarism, falsifying results, or misrepresenting conditions—makes it impossible to advance our understanding of the physical universe.

Recipients are “responsible for maintaining the integrity of research of any kind under an award from DOE including the prevention, detection, and remediation of research misconduct, and the conduct of inquiries, investigations, and adjudication of allegations of research misconduct,” and conducting appropriate administrative processes in response to allegations of research misconduct in accordance with 10 CFR 600.31 Research misconduct (TIAs). Allegations of any misconduct under an award resulting from this FOA must be reported to the appropriate institutional officials in accordance with institutional policies against misconduct. Additional information on DOE research misconduct policies can be found at: <https://science.osti.gov/grants/Policy-and-Guidance/Research-Misconduct>.

18. Rights in Technical Data

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

“Limited Rights Data”: The U.S. government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.

Government Rights in Technical Data Produced Under Awards: The U.S. government normally retains unlimited rights in technical data produced under government financial assistance awards, including the right to distribute to the public. However, pursuant to special statutory authority, certain categories of data generated under this SC awards may be protected from public disclosure for up to five years after the data is generated (“Protected Data”). For awards permitting Protected Data, the protected data must be marked as set forth in the awards intellectual property terms and conditions and a listing of unlimited rights data (i.e., non-protected data) must be inserted into the data clause in the award. In addition, invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

For this FOA, the funding program has determined that an extended period of protection twenty years is reasonably required for commercialization and will apply to certain categories of data first produced under the resulting awards in accordance with 15 U.S.C. § 3710a(c)(7)(B)(ii) and the Energy Policy Acts of 1992 and 2005. Information regarding the categories of data and period of protection will be provided during the negotiation process.

Additionally, selectees and recipients may request an extended period of protection (not to exceed thirty years) if reasonably required for commercialization for specific categories of data for Topic Areas first produced under the resulting awards in accordance with 15 U.S.C. § 3710a(c)(7)(B)(ii) and the Energy Policy Acts of 1992 and 2005. Further direction will be provided during the negotiation process upon request.

If software is specified for delivery to DOE, or if other special circumstances exist, e.g., DOE specifying “open-source” treatment of software, then the DOE Contracting Officer, after negotiation with the recipient, may include in the award special provisions requiring the recipient to obtain written approval of the DOE Contracting Officer prior to asserting copyright in the software, modifying the retained Government license, and/or otherwise altering the copyright provisions.

19. Subaward and Executive Reporting

Additional administrative requirements necessary for DOE financial assistance transactions that authorize the non-Federal entities' expenditure of Federal funds, i.e., TIAs, to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR 170. (See: www.eCFR.gov). Prime awardees must register with the new FSRS database at

<https://www.fsrs.gov> and report the required data on their first tier subrecipients. Prime awardees must report the executive compensation for their own executives as part of their registration profile in SAM.

20. Title to Subject Inventions

This FOA allows applicants to request Technology Investment Agreements (TIAs). In a TIA, the intellectual property rights may not be subject to the requirements of the Bayh-Dole Act or 42 U.S.C. 5908 and may be negotiable. If the applicant requests a TIA and DOE determines it is appropriate to award a TIA, patent rights may be negotiated pursuant to the guidance set forth in 10 CFR Parts 603.840 through 603.875.

Ownership of subject inventions is governed pursuant to the authorities listed below:

- **Nonprofit organizations or small business firms:** Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), nonprofit organizations or small business firms as defined by 35 U.S.C. 201 may elect to retain title to their subject inventions subject to the above identified U.S. Competitiveness Provision.
- **All other parties:** The federal Non-Nuclear Energy Act of 1974, 42. U.S.C. 5908, provides that the government obtains title to new inventions unless a waiver is granted (see below).
- **Class Patent Waiver:** DOE anticipates issuing a class patent waiver that applies to this FOA for any domestic large business that is a recipient, or subrecipient at any tier to this FOA and is providing at least 20% cost share. Under this class patent waiver, domestic large businesses would be able to elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. A domestic large business, as used in the anticipated class patent waiver, is any for-profit entity that does not qualify as a “small business” under Bayh-Dole and is incorporated (or otherwise formed) under the laws of a particular state or territory of the United States and is not owned, controlled, or influenced by a foreign government, agency, firm, corporation or person. To avail itself of the class patent waiver, a domestic large business would have to agree that any products embodying or produced through the use of a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States. Entities not eligible under the Class Patent Waiver would still be able to petition DOE for rights under an Advanced or Identified Patent Waiver as described below.
- **Patent Waiver:** Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784. For more information, see <https://energy.gov/gc/services/technology-transfer-and-procurement/office-assistant-general-counsel-technology-transf-1> . Nonprofit organizations and small business firms do not need a patent waiver in order to retain title to their subject inventions (see above).
- **Determination of Exceptional Circumstances (DEC):** On June 07, 2021, DOE approved a DETERMINATION OF EXCEPTIONAL CIRCUMSTANCES (DEC) UNDER THE

BAYH-DOLE ACT TO FURTHER PROMOTE DOMESTIC MANUFACTURE OF DOE SCIENCE AND ENERGY TECHNOLOGIES. In accordance with this DEC, all awards, including sub-awards, under this FOA shall include the U.S. Competitiveness Provision in accordance with [Section VIII](#) of this FOA. A copy of the DEC can be found at <https://www.energy.gov/gc/determination-exceptional-circumstances-decs>.

- Pursuant to 37 CFR § 401.4, any nonprofit organization or small business firm as defined by 35 U.S.C. 201 affected by any DEC has the right to appeal it by providing written notice to DOE within 30 working days from the time it receives a copy of the determination.
- DOE may issue and publish on the website above further DEC's prior to the issuance of awards under this FOA. DOE may require additional submissions or requirements as authorized by any applicable DEC.

Nonprofit organizations and small business firms do not need a patent waiver in order to retain title to their subject inventions (see above).

21. U.S. Competitiveness

A primary objective of DOE's multi-billion-dollar research, development and demonstration investments is to cultivate new research and development ecosystems, manufacturing capabilities, and supply chains for and by U.S. industry and labor. Therefore, in exchange for receiving taxpayer dollars to support an applicant's project, the applicant must agree to a U.S. Competitiveness provision requiring that any products embodying any subject invention or produced through the use of any subject invention will be manufactured substantially in the United States unless the Recipient can show to the satisfaction of DOE that it is not commercially feasible. Award terms, including the U.S. Competitiveness Provision, are available at <https://www.energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>.

Please note that a subject invention is any invention conceived or first actually reduced in performance of work under an award. An invention is any invention or discovery which is or may be patentable. The recipient includes any awardee, recipient, sub-awardee, or sub-recipient.

As noted in the U.S. Competitiveness Provision, if an entity cannot meet the requirements of the U.S. Competitiveness Provision, the entity may request a modification or waiver of the U.S. Competitiveness Provision. For example, the entity may propose modifying the language of the U.S. Competitiveness Provision in order to change the scope of the requirements or to provide more specifics on the application of the requirements for a particular technology. As another example, the entity may request that the U.S. Competitiveness Provision be waived in lieu of a net benefits statement or U.S. manufacturing plan. The statement or plan would contain specific and enforceable commitments that would be beneficial to the U.S. economy and competitiveness. Examples of such commitments could include manufacturing specific products in the U.S., making a specific investment in a new or existing U.S. manufacturing facility, keeping certain activities based in the U.S. or supporting a certain number of jobs in the U.S. related to the technology. DOE may, in its sole discretion, determine that the proposed modification or waiver promotes commercialization and provides sufficient U.S. economic benefits, and grant the request. If granted, DOE will modify the award terms and conditions for

the requesting entity accordingly. More information and guidance on the waiver and modification request process can be found in the DOE Financial Assistance Letter on this topic, available [here](#). Additional information on DOE's Commitment to Domestic Manufacturing for DOE-funded R&D is available at <https://www.energy.gov/gc/us-manufacturing>.

The U.S. Competitiveness Provision is implemented by DOE pursuant to a Determination of Exceptional Circumstances (DEC) under the Bayh-Dole Act and DOE Patent Waivers. See [Section VIII](#).

22. Committee on Foreign Investment in the United States (CFIUS)

If a transaction could result in a foreign person investing in a United States business such that the transaction poses national security risks to U.S. critical infrastructure or U.S. critical technologies, the Exon-Florio Amendment to the Defense Production Act of 1950, as amended (Exon-Florio) authorizes the President of the United States (or the President's designees) to investigate and prohibit, suspend, or limit the transaction. The review and investigation process under Exon-Florio is conducted by the CFIUS, an inter-agency committee chaired by the Secretary of the Treasury. 31 CFR 800 Regulations Pertaining to Certain Investments in the United States by Foreign Persons.

D. REFERENCE MATERIAL

Glossary of Useful terms

<p>Acquisition cost</p>	<p><i>Acquisition cost</i> means the cost of the asset including the cost to ready the asset for its intended use. Acquisition cost for equipment, for example, means the net invoice price of the equipment, including the cost of any modifications, attachments, accessories, or auxiliary apparatus necessary to make it usable for the purpose for which it is acquired. Acquisition costs for software includes those development costs capitalized in accordance with generally accepted accounting principles (GAAP). Ancillary charges, such as taxes, duty, protective in transit insurance, freight, and installation may be included in or excluded from the acquisition cost in accordance with the non-Federal entity's regular accounting practices.</p> <p>For TIAs and treatment of acquisition costs for equipment and real property, see 10 CFR § 603.680 Purchase of real property and equipment by for-profit firms.</p>
<p>Administrative requirements</p>	<p><i>Administrative requirements</i> mean the general business management practices that are common to the administration of all awards, such as financial accountability, reporting, equipment management, and retention of records.</p>
<p>Advance payment</p>	<p><i>Advance payment</i> means a payment that a Federal awarding agency or pass-through entity makes by any appropriate payment mechanism, including a predetermined payment schedule, before the non-Federal entity disburses the funds for program purposes.</p> <p>A fixed-support TIA does not preclude use of an initial advance payment, if there is no alternative to meeting immediate cash needs. 10 CFR § 603.805 Payment methods.</p>
<p>Allocation</p>	<p><i>Allocation</i> means the process of assigning a cost, or a group of costs, to one or more cost objective(s), in reasonable proportion to the benefit provided or other equitable relationship. The process may entail assigning a cost(s) directly to a final cost objective or through one or more intermediate cost objectives.</p>
<p>Allocability</p>	<p><i>Allocability</i> means the principle which requires that an expense or service charged must directly benefit and be necessary for the performance of the project; when multiple projects are benefited reasonable proportions must be able to be assigned.</p>
<p>Allowable cost</p>	<p><i>Allowable cost</i> means a cost incurred by a recipient that is: (1) reasonable for the performance of the award; (2) allocable; (3) in conformance with any limitations or exclusions set forth in the Federal cost principles applicable to the organization incurring the cost or in the award documents as to the type or amount of cost; (4) consistent with regulations, policies, and procedures of the recipient that are applied uniformly to both federally supported and other activities of the organization; (5) accorded consistent treatment as a direct or indirect cost; (6) determined in accordance with generally accepted accounting principles; and (7) not included as a cost in any other federally supported award (unless specifically authorized by statute).</p>
<p>Application</p>	<p><i>Application</i> means a request for financial support of a project or activity submitted to DOE on specified forms and in accordance with DOE instructions. Also known as a proposal.</p>
<p>Appropriation Act</p>	<p><i>Appropriation act</i> means the statute that provides the authority for Federal agencies to incur obligations to and make payments out of the U.S. treasury for</p>

	specified purposes.
Approved budget	The <i>approved budget</i> for the Federal award summarizes the financial aspects of the project or program as approved during the Federal award process. It may include either the Federal and non-Federal share or only the Federal share, depending upon Federal awarding agency requirements. It must be related to performance for program evaluation purposes whenever appropriate.
Assurance	<i>Assurance</i> means a certification by an applicant, normally included with the application or State plan, indicating that the entity is in compliance with, or that it will abide by, a particular requirement if it receives a Federal award.
Authorized organizational representative	<i>Authorized organizational representative</i> means the individual, named by the applicant organization, who is authorized to act for the applicant and to assume the obligations imposed by the Federal laws, regulations, requirements, and conditions that apply to awards.
Award	<i>Award</i> means the provision of funds by DOE, based on an approved application and budget or progress report, to an organizational entity or an individual to carry out a project or activity.
Award documents	<i>Award documents</i> means the entirety of the documents describing the legal relationship between DOE and an awardee or recipient. The award documents include an Assistance Agreement and other documents which may be incorporated by reference or as attachments to the Assistance Agreement. The award documents are the official, legally binding document, signed (or the electronic equivalent of signature) by a Contracting Officer that: <ul style="list-style-type: none"> • notifies the recipient of the award of a TIA; • contains or references all the terms and conditions and Federal funding limits and obligations; and, • provides the documentary basis for recording the obligation of Federal funds in the DOE accounting system.
Bayh-Dole Act	<i>Bayh-Dole Act</i> means a law which encourages universities and researchers to develop their inventions into marketable products; formal citation is Section 6 of the Patent and Trademark Amendment of 1980, Pub. L 96-517 as amended.
Budget	<i>Budget</i> means the financial plan for the project or program that the Federal awarding agency or pass-through entity approves during the Federal award process or in subsequent amendments to the Federal award. It may include the Federal and non-Federal share or only the Federal share, as determined by the Federal awarding agency or pass-through entity.
Budget period	<i>Budget period</i> means the intervals of time (usually 12 months each) into which a project period is divided for budgetary and funding purposes.
Business officer	<i>Business officer</i> means the financial official of the recipient who has primary fiscal responsibility for the award. Also known as authorized organizational representative.
Capital assets	<i>Capital assets</i> means tangible or intangible assets used in operations having a useful life of more than one year which are capitalized in accordance with GAAP. Capital assets include: <ol style="list-style-type: none"> (a) Land, buildings (facilities), equipment, and intellectual property (including software) whether acquired by purchase, construction, manufacture, lease-purchase, exchange, or through capital leases; and (b) Additions, improvements, modifications, replacements, rearrangements, reinstallations, renovations or alterations to capital assets that materially increase their value or useful life (not ordinary repairs and maintenance).
Carryover	<i>Carryover</i> means unobligated Federal funds remaining at the end of any budget period that may be carried forward to another budget period to cover allowable costs of that budget period (whether as an offset or additional authorization). Obligated, but unliquidated, funds are not considered carryover.

Change in scope	<i>Change in scope</i> means an activity whereby the objectives or specific aims identified in the approved grant application are significantly changed by the recipient after award. Contracting Officer prior approval is required for a change in scope to be allowable under an award.
Closeout	<i>Closeout</i> means the process by which a Federal awarding agency determines that all applicable administrative actions and all required work under an award have been completed by the recipient and the Federal awarding agency.
Competitive segment	<i>Competitive segment</i> means the initial project period recommended for support or each extension of a project period resulting from a renewal award.
Conference (domestic or international)	<i>Conference (domestic or international)</i> means a symposium, seminar, workshop, or any other organized and formal meeting, whether conducted face-to-face or via the Internet, where individuals assemble (or meet virtually) to exchange information and views or explore or clarify a defined subject, problem, or area of knowledge, whether or not a published report results from such meeting.
Consortium or sub-award agreement	<i>Consortium or sub-award agreement</i> means a formalized agreement whereby a research project is carried out by the awardee and one or more other organizations that are separate legal entities. Under the agreement, the awardee must perform a substantive role in the conduct of the planned research and not merely serve as a conduit of funds to another party or parties. These agreements typically involve a specific level of effort from the consortium organization's PD/PI and a categorical breakdown of costs, such as personnel, supplies, and other allowable expenses, including F&A costs. The relationship between the recipient and the collaborating organizations is considered a sub-award relationship.
Consultant	<i>Consultant</i> means an individual who provides professional advice or services for a fee, but not as an employee of the engaging party. To prevent apparent or actual conflicts of interest, awardees and consultants must establish written guidelines indicating the conditions of payment of consulting fees. Consultants also include firms that provide professional advice or services.
Continuation application/award	<i>Continuation application/award</i> means a financial assistance request (in the form of an application or progress report) or resulting award for a subsequent budget period within a previously approved project period for which a recipient does not have to compete with other applicants.
Contract	<i>Contract</i> means a legal instrument by which a non-Federal entity purchases property or services needed to carry out the project or program under a Federal award. The term as used in this part does not include a legal instrument, even if the non-Federal entity considers it a contract, when the substance of the transaction meets the definition of a Federal award or sub-award (see 10 CFR 600.3 Definitions (TIAs)).
Contractor	<i>Contractor</i> means an entity that receives a contract as defined in 10 CFR 600.3 Definitions (TIAs)
Contracting (or Grants) Officer	<i>Contracting (or Grants) Officer</i> means a DOE official responsible for the business management aspects of TIAs, including review, negotiation, award, and administration, and for the interpretation of administration policies and provisions. COs and GOs are delegated the authority to obligate DOE to the expenditure of funds and permit changes to approved projects on behalf of DOE.
Contracting (or Grants Management) specialist	<i>Contracting (or Grants Management) specialist</i> means a DOE staff member who works with a Contracting or Grants Officer and is assigned the day-to-day management of a portfolio of TIAs. These activities include, but are not limited to, evaluating applications for administrative content and compliance with statutes, regulations, and guidelines; negotiating awards; providing consultation and technical assistance to recipients; and administering awards.
Cooperative agreement	<i>Cooperative agreement</i> means a type of financial assistance used when there

	will be substantial Federal scientific or programmatic involvement. Substantial involvement means that, after award, scientific or program staff will assist, guide, coordinate, or participate in project activities.
Cost principles	<p><i>Cost principles</i> means the government-wide principles in the case of commercial organizations, the Federal Acquisition Regulation [48 CFR 31]), on allowability and unallowability of costs under federally sponsored agreements.</p> <p>Fixed-support TIAs are not required to follow the aforementioned cost principles. 10 CFR § 603.315 Advantages of a fixed-support TIA.</p> <p>Expenditure-based TIAs are required to apply the Government cost principles in 48 CFR part 31 if the applicant currently perform under expenditure-based Federal procurement contracts or assistance awards (other than a TIA), unless an exception is granted pursuant to 10 CFR § 603.625 Cost principles or standards applicable to for-profit participants. paragraph (b). Expenditure-based TIAs not required to apply the Government cost principles in 48 CFR part 31 should see 10 CFR § 603.625 Cost principles or standards applicable to for-profit participants, paragraph (b).</p>
Cost sharing or matching	<i>Cost sharing or matching</i> means the portion of project costs not paid by Federal funds (unless otherwise authorized by Federal statute). See also 10 CFR 600.3 Definitions (TIAs)).
Deadline	<i>Deadline</i> means the published date and/or time that an application is to be submitted to the funding agency.
Debarment and suspension	<i>Debarment and suspension</i> mean the actions taken by a debarring official in accordance with OMB guidance at 2 CFR 180, “Non-procurement Debarment and Suspension,” to exclude a person or organization from participating in grants and other non-procurement awards government-wide. If debarred or suspended, the person or organization may not receive financial assistance (under a TIA, or sub-award, or contract under a TIA) for a specified period of time. Debarments and suspensions carried out pursuant to 2 CFR 376 are distinct from post-award suspension action by an awarding agency. See 10 CFR § 603.125 Applicability of other parts of the DOE Assistance Regulations and Appendix B to 10 CFR Part 603 - Flow Down Requirements for Purchases of Goods and Services, B., 2. (TIAs).
Direct costs	<i>Direct costs</i> means costs that can be identified specifically with a particular sponsored project, an instructional activity, or any other institutional activity, or that can be directly assigned to such activities relatively easily with a high degree of accuracy.
Disallowed costs	<i>Disallowed costs</i> mean those charges to a Federal award that the Federal awarding agency or pass-through entity determines to be unallowable, in accordance with the applicable Federal statutes, regulations, or the terms and conditions of the Federal award.
Domestic organization	<i>Domestic organization</i> means a public (including a State or other governmental agency) or private non-profit or for-profit organization that is located in the United States or its territories, is subject to U.S. laws, and assumes legal and financial accountability for awarded funds and for the performance of the TIA-supported activities.
Effort	<i>Effort</i> means the amount of time, usually expressed as a percentage of the total, which a faculty member or other employee spends on a sponsored project. No one is allowed to spend more than 100% total commitment on all academic activities, including TIA-sponsored research, university-sponsored research, teaching, administration, advising and other contracted duties. Effort is indicated on the budget in units of person-months.

Equipment	<i>Equipment</i> means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-Federal entity for financial statement purposes, or \$5,000. For TIAs, see 10 CFR § 603.680 Purchase of real property and equipment by for-profit firms.
Expanded authorities	<i>Expanded authorities</i> means authorization to recipients under certain research award mechanisms which waives the requirement for prior agency approval for specified actions related to awards. Example: 90-day pre-award spending authority, no cost extensions for up to one additional year, and automatic carryover of unobligated funds from one budget period to the next. The expanded authorities are now contained in the standard terms and conditions for most research awards.
Expiration date	<i>Expiration date</i> means generally, the date signifying the end of the current project period, after which the recipient is not authorized to obligate award funds.
Facilities and administrative costs	<i>Facilities and administrative costs</i> mean costs that are incurred by a recipient for common or joint objectives and that, therefore, cannot be identified specifically with a particular project or program. These costs also are known as indirect costs.
Federal financial report	<i>Federal financial report</i> means submitted on Standard Form (SF) 425, to indicate the status of awarded funds for the period covered. Frequency of reporting is specified in the Reporting Checklist provided as part of the award documents.
Financial assistance	<i>Financial assistance</i> means transfer by DOE of money or property to an eligible entity to support or stimulate a public purpose authorized by statute.
Financial status report	<i>Financial status report</i> means see Federal Financial Report.
Foreign travel	<i>Foreign travel</i> is meant to include travel outside of North America (Canada, Mexico, and the United States) and U.S. territories and possessions (Guam, American Samoa, Puerto Rico, the U.S. Virgin Islands. A trip is considered foreign travel for all legs of the itinerary if the traveler does not return to his or her post prior to departure for a foreign destination. Costs for foreign travel may be restricted by the language of a Funding Opportunity Announcement.
Funding opportunity announcement (FOA)	<i>Funding opportunity announcement (FOA)</i> means a publicly available document by which a Federal Agency makes known its intentions to award discretionary TIAs, usually as a result of competition for funds. Funding opportunity announcements may be known as program announcements, requests for applications, notices of funding availability, solicitations, or other names depending on the Agency and type of program. Funding opportunity announcements can be found at www.Grants.gov . An FOA may also be known as a solicitation.
TIA-supported project or activity	<i>TIA-supported project or activity</i> means those activities specified or described in an application or in a subsequent submission that are approved by DOE for funding, regardless of whether Federal funding constitutes all or only a portion of the financial support necessary to carry them out.
Grants.gov	<i>Grants.gov</i> (https://www.Grants.gov/) has been designated by the Office of Management and Budget as the single access point for all grant programs offered by 26 Federal grant-making agencies. It provides a single interface for agencies to announce their grant opportunities and for all applicants to find and apply for those opportunities.
Indirect costs (facilities & administrative)	<i>Indirect (F&A) costs</i> means those costs incurred for a common or joint purpose benefitting more than one cost objective, and not readily assignable to the cost objectives specifically benefitted, without effort disproportionate to the results achieved. To facilitate equitable distribution of indirect expenses to the cost objectives served, it may be necessary to establish a number of pools

	of indirect (F&A) costs. Indirect (F&A) cost pools must be distributed to benefitted cost objectives on bases that will produce an equitable result in consideration of relative benefits derived.
Institutional base salary	<i>Institutional base salary</i> means the annual compensation paid by an organization for an employee’s appointment, whether that individual’s time is spent on research, teaching, patient care, or other activities. Base salary excludes any income that an individual may be permitted to earn outside of duties for the applicant/awardee organization. Base salary may not be increased as a result of replacing organizational salary funds with grant funds.
Matching or cost sharing	<i>Matching or cost sharing</i> means the value of third-party in-kind contributions and the portion of the costs of a Federally assisted project or program not borne by the Federal government. Matching or cost sharing may be required by statute or program regulation. Costs used to satisfy matching or cost-sharing requirements are subject to the same policies governing allowability as other costs under the approved budget.
Merit (or peer) review	<i>Merit (or peer) review</i> means the process that involves the consistent application of standards and procedures that produce fair, equitable, and objective examinations of applications based on an evaluation of scientific or technical merit or other relevant aspects of the application. The review is performed by experts (reviewers) in the field of endeavor for which support is requested. Merit review is intended to provide guidance to the DOE individuals responsible for making award decisions.
Monitoring	<i>Monitoring</i> means a process whereby the programmatic and business management performance aspects of an award are assessed by reviewing information gathered from various required reports, audits, site visits, and other sources.
NEPA	<i>NEPA</i> means the National Environmental Policy Act (NEPA), Public Law 91-190, as amended. NEPA requires Federal agencies to assess the environmental effects of proposed major Federal actions prior to making decisions.
No-cost extension	<i>No-cost extension</i> means an extension of time to a project period and/or budget period to complete the work of the or TIA under that period, without additional Federal funds or competition.
Non-Federal share	<i>Non-Federal share</i> means when cost sharing or matching is not required as a condition of an award, the portion of allowable project/program costs not borne by the Federal government.
Obligations	<i>Obligations</i> when used in connection with a non-Federal entity’s utilization of funds under a Federal award, <i>obligations</i> means orders placed for property and services, contracts and sub-awards made, and similar transactions during a given period that require payment by the non-Federal entity during the same or a future period.
OMB circulars	<i>OMB circulars</i> means government-wide guidance issued to Heads of Federal agencies by the Director of the Office of Management and Budget.
Other significant contributors	<i>Other significant contributors</i> means individuals who have committed to contribute to the scientific development or execution of the project, but are not committing any specified measurable effort (i.e., person months) to the project. These individuals are typically presented at “effort of zero person months” or “as needed.” Individuals with measurable effort may not be listed as Other Significant Contributors (OSCs). Consultants should be included if they meet this definition.
Program participant	<i>Program participants</i> are the recipients of service or training provided at a workshop, conference, seminar, symposium or other short-term instructional or information-sharing activity funded by an external grant or award, or the training beneficiaries of the project or program funded by an external grant or award. A participant is not involved in providing any deliverable to the recipient or a third party or would not be terminated or replaced for failure to

	perform.
Participant support costs	<i>Participant support costs</i> means direct costs for items such as stipends or subsistence allowances, travel allowances, and registration fees paid to or on behalf of participants or trainees (but not employees) in connection with conferences or training projects.
Person months	<i>Person months</i> is the metric for expressing the effort (amount of time) PD/PI(s), faculty and other senior/key personnel devote to a specific project. The effort is based on the type of appointment of the individual with the organization; e.g., calendar year, academic year, and/or summer term; and the organization’s definition of such. For instance, some institutions define the academic year as a 9-month appointment while others define it as a 10-month appointment.
Pre-application or pre-proposal	<p><i>Pre-application or pre-proposal</i> means a brief outline or narrative of proposed work and sometimes budget, for informal review by a sponsor to determine whether an application should be submitted. Three predominant reasons for requiring submission of a preliminary pre-application are:</p> <ul style="list-style-type: none"> • Reduce the applicant’s unnecessary effort in proposal preparation when the chance of success is very small. This is particularly true of exploratory initiatives where the community senses that a major new direction is being identified, or competitions that will result in a small number of actual awards. • Increase the overall quality of the submission. • Distill the number of applications that will be submitted to the agency and the number of anticipated reviewers needed to review.
Pre-award costs	<p><i>Pre-award costs</i> means any cost incurred prior to the beginning date of the project period or the initial budget period of a competitive segment (under a multi-year award), in anticipation of the award and at the applicant’s own risk, for otherwise allowable costs.</p> <p>Pre-award costs, as long as they are otherwise allowable costs of the project, may be charged to an expenditure-based TIA only with the specific approval of the contracting officer. 10 CFR § 603.830 Pre-award costs.</p>
Prior approval	<i>Prior approval</i> means written approval from the designated Contracting Officer.
Program Director/ Principal Investigator	<i>Program Director/ Principal Investigator</i> means the individual(s) designated by the applicant organization to have the appropriate level of authority and responsibility to direct the project or program to be supported by the award. The applicant organization may designate multiple individuals as program directors/principal investigators (PD/PIs) who share the authority and responsibility for leading and directing the project, intellectually and logistically. When multiple PD/PIs are named, each is responsible and accountable to the applicant organization, or as appropriate, to a collaborating organization for the proper conduct of the project or program including the submission of all required reports. The presence of more than one PD/PI on an application or award diminishes neither the responsibility nor the accountability of any individual PD/PI.
Program income	<i>Program income</i> means gross income earned by the non-Federal entity that is directly generated by a supported activity or earned as a result of the Federal award during the period of performance except as provided in regulation. For TIAs, see 10 CFR 603.1305 Program income. Program income includes but is not limited to income from fees for services performed, the use or rental or real or personal property acquired under Federal awards, the sale of commodities or items fabricated under a Federal award, license fees and royalties on patents

	and copyrights, and principal and interest on loans made with Federal award funds. Interest earned on advances of Federal funds is not program income. Except as otherwise provided in Federal statutes, regulations, or the terms and conditions of the Federal award, program income does not include rebates, credits, discounts, and interest earned on any of them. See also 35 USC 200-212 “Disposition of Rights in Educational Awards” for inventions made under Federal awards.
Program Manager	<i>Program Manager</i> means the DOE official responsible for the programmatic, scientific, and/or technical aspects of a TIA. The same role is filled by Program Directors, Program Officers, or Project Directors at other Federal agencies.
Progress report	<i>Progress report</i> means periodic, frequently annual, report submitted by the awardee and used by DOE to assess progress and to determine whether to provide funding for the budget period subsequent to that covered by the report.
Project/performance site	<i>Project/ performance site</i> means location(s) of where the work described in the research plan will be conducted.
Project period	<i>Project period</i> means the total time for which Federal support of a project has been programmatically approved as shown in the award documents; however, it does not constitute a commitment by the Federal government to fund the entire period. The total award period comprises the initial competitive segment, any subsequent competitive segments resulting from a renewal award(s), and extensions.
Proposal	See application.
Re-budgeting	<i>Re-budgeting</i> means reallocation of funds available for spending between approved budget categories to allow best use of funds to accomplish the project goals.
Recipient	<i>Recipient</i> means the organizational entity or individual receiving a TIA.
Renewal application	<i>Renewal application</i> means an application requesting additional funding for a period subsequent to that provided by a current award. Renewal applications compete for funds with all other peer reviewed applications and must be developed as fully as though the applicant is applying for the first time.
Research	<i>Research</i> is defined as a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. See 10 CFR 600.3 Definitions (TIAs).
Research misconduct	<i>Research misconduct</i> means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but does not include honest error or differences of opinion. See 10 CFR 600.31 Research misconduct (TIAs).
SAM.gov	<i>SAM.gov</i> is the System for Award Management (SAM) a consolidated service that includes Entity Registration, Assistance Listings, and other services for making, managing, and receiving Federal awards.
Scope of work	<i>Scope of work</i> means the aims, objectives, and purposes of a TIA; as well as the methodology, approach, analyses or other activities; and the tools, technologies, and timeframes needed to meet the objectives of the TIA. This includes the research or training plan included with the original application, along with any approved modifications.
Senior/Key Personnel	<i>Senior/Key personnel</i> means the PD/PI and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the award. Typically, these individuals have doctoral or other professional degrees, although individuals at the masters or baccalaureate level may be considered senior/key personnel if their involvement meets this definition. Consultants and those with a postdoctoral role also may be considered senior/key personnel if they meet this definition. “Zero percent” effort or “as needed” is not an acceptable level of involvement for Senior/Key Personnel.

Significant re-budgeting	<i>Significant re-budgeting</i> means a threshold that is reached when expenditures in a single direct cost budget category deviate (increase or decrease) from the categorical commitment level established for the budget period by more than 25 percent of the total costs awarded. Significant re-budgeting is one indicator of change in scope.
Small business concern	<i>Small business concern</i> means a business that meets the regulatory and size requirements established by the SBA at 13 CFR 121.
Solicitation	See Funding Opportunity Announcement.
Subaward	<i>Subaward</i> means a legal instrument by which a recipient provides funds (or property in lieu of funds) to an eligible subrecipient (or a lower-tier transaction) to perform a substantive portion of the TIA-supported program or project. The term includes such financial assistance when provided by any legal agreement (even if the agreement is called a contract) but does not include any form of assistance which is excluded from the definition of a TIA, including the recipient's procurement of property or services needed to carry out the project or program. The term includes consortium agreements.
Subrecipient	<i>Subrecipient</i> means a non-Federal entity that receives a subaward from a pass-through entity to carry out part of a Federal program; but does not include an individual that is a beneficiary of such program. A sub-recipient may also be a recipient of other Federal awards directly from a Federal awarding agency.
Supplement	<i>Supplement</i> means a request for an increase in support during a current budget period for expansion of the project's scope or to meet increased costs unforeseen at the time of the new or renewal application. A supplement may increase support for future years in addition to the current year. Supplements require applications and are subject to administrative and merit review.
Technology Investment Agreement (TIA)	<i>A Technology Investment Agreement (TIA)</i> means a special type of assistance instrument used to increase involvement of commercial firms in the DOE's research, development and demonstration (RD&D) programs. A TIA, ..., requires substantial Federal involvement in the technical or management aspects of the project. 10 C.F.R. 603.105 Description.
Terms and conditions of award	<i>Terms and conditions of award</i> means all legal requirements imposed on a TIA by DOE, whether based on statute, regulation, policy, or other document referenced in the award, or specified by the award document itself. The award documents may include both standard and special conditions that are considered necessary to attain the TIA's objectives, facilitate post-award administration of the award, conserve TIA funds, or otherwise protect the Federal government's interests.
UEI	<i>UEI</i> is the Unique Entity Identifier, a twelve-digit alphanumeric sequence established and assigned by the System for Award Management at https://www.SAM.gov to uniquely identify an entity.
Unallowable costs	<i>Unallowable costs</i> means costs that cannot be charged, directly or indirectly, to Federal awards because the costs are prohibited by law, regulation (including applicable cost principles), or the terms and conditions of award. Costs that are not allowable, allocable, or reasonable are unallowable.
Unliquidated obligation	<i>Unliquidated obligations</i> means, for financial reports prepared on a cash basis, obligations incurred by the non-Federal entity that have not been paid (liquidated). For reports prepared on an accrual expenditure basis, these are obligations incurred by the non-Federal entity for which an expenditure has not been recorded.
Unobligated balance	<i>Unobligated balance</i> means the amount of funds under a Federal award that the non-Federal entity has not obligated. The amount is computed by subtracting the cumulative amount of the non-Federal entity's unliquidated

	obligations and expenditures of funds under the Federal award from the cumulative amount of the funds that the Federal awarding agency or pass-through entity authorized the non-Federal entity to obligate.
Validate	In the context of the data management plan requirements, <i>validate</i> means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses, comparing and contrasting the results against those of a new experiment or analyses, or by some other means.