

**U.S. Department of Energy (DOE)
Office of Energy Efficiency and Renewable Energy**

**Bipartisan Infrastructure Law (BIL) Enhanced Geothermal
Systems (EGS) Pilot Demonstrations**

Funding Opportunity Announcement (FOA) Number: DE-FOA-0002826

FOA Type: Modification No. 0003

Assistance Listing Number: 81.087

FOA Second Round Issue Date:	06/25/2024
Informational Webinar:	06/26/2024 1:00 p.m. ET
Submission Deadline for Second Round Letters of Intent:	07/18/2024 5:00 p.m. ET
Submission Deadline for Second Round Full Applications:	09/25/2024 5:00 p.m. ET
Expected Date for Second Round EERE Selection Notifications:	12/2024
Expected Timeframe for Second Round Award Negotiations:	01/2025

- The First Round of this FOA opened 02/08/2023, full applications were due 06/16/2023, and selections announced 02/13/2024. The First Round is closed.
- Applicants **for the Second Round** must submit a Letter of Intent by 5 p.m. ET on the due date listed in the above table to be eligible to submit a Full Application.
- To apply to this FOA, applicants must register with and submit application materials through EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>, EERE’s online application portal.
- Applicants must designate primary and backup points-of-contact in EERE eXCHANGE with whom EERE will communicate to conduct award negotiations. If an application is selected for award negotiations, it is not a commitment to issue an award. It is imperative that the applicant/selectee be responsive during award negotiations and meet negotiation deadlines. Failure to do so may result in cancelation of further award negotiations and rescission of the selection.
- **Unique Entity Identifier (UEI) and System for Award Management (SAM)** - Each applicant (unless the applicant is excepted from those requirements under 2 CFR

25.110) is required to: (1) register in the SAM at <https://www.sam.gov> before submitting an application; (2) provide a valid UEI number in the application; and (3) maintain an active SAM registration with current information when the applicant has an active federal award or an application or plan under consideration by a federal awarding agency. DOE may not make a federal award to an applicant until the applicant has complied with all applicable UEI and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a federal award, DOE will determine that the applicant is not qualified to receive a federal award and use that determination as a basis for making a federal award to another applicant.

NOTE: Due to the high number of UEI requests and SAM registrations, entity legal business name and address validations are taking longer than expected to process. Entities should start the UEI and SAM registration process as soon as possible. If entities have technical difficulties with the UEI validation or SAM registration process, they should use the [HELP](#) feature on [SAM.gov](#). SAM.gov will address service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue. Additional entity validation resources can be found here: [GSAFSD Tier 0 Knowledge Base - Validating your Entity](#).

Modifications

All modifications related to technical content changes in the FOA are HIGHLIGHTED in the body of the FOA.

Mod. No.	Date	Description of Modification
0001	02/09/2023	Full Application Deadline changed to 06/16/2023
0002	04/27/2023	Updating the Expected Timeframe for First Round Award Negotiations to 11/2023 and Correcting the SOPO page limit to 12 pages
0003	06/13/2024	Updating the Dates and Timeframe for the Second Round.
0003	06/13/2024	Topic Area 4 language updated to allow for projects to propose thermal power production only. See Sections I, V.
0003	06/13/2024	Updated Technical Review Criterion (page 88)

Bipartisan Infrastructure Law (BIL) Modifications

All modifications related to Bipartisan Infrastructure Law (BIL) updates/revisions in the FOA are not HIGHLIGHTED in the body of the FOA but listed here. The updates to BIL throughout this FOA are substantial and the Department of Energy (DOE) Geothermal Technologies Office (GTO) suggests giving each attention before applying to this FOA.

Section	Sub-Section	Description of Modification
APPENDIX C		Revised content for Waiver Request requirement
APPENDIX D		Added content, footnotes and link to Buy America Waiver Request
I. Funding Opportunity Description	A. Background and Context	Updated Teaming Partner List instructions to reflect new process within eXCHANGE (Page 9)
I. Funding Opportunity Description	F. R&D Community Benefits Plan	Added the R&D Community Benefits Plan description and guidance specific to this section and throughout
III. Eligibility Information	A. Eligible Applicants	Deleted Incorporated Consortia and Unincorporated Consortia sections
III. Eligibility Information	E. Other Eligibility Requirements	Deleted and replaced Section ii. Requirements for DOE/NNSA and Non-DOE/NNSA FFRDCs Included as a Subrecipient. This section now includes agreement requirements and therefore

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		iii. Agreement Requirements for DOE/NNSA FFRDCs Participating as a Subrecipient is deleted.
IV. Application and Submission Information	B. Application Forms	Updated eXCHANGE instruction to reflect increase to 50MB maximum file upload limitation (Page 50)
IV. Application and Submission Information	A. Application Process (and throughout)	Addition of Principle Investigator throughout as it applies to R&D FOAs
IV. Application and Submission Information	D. Content and Form of the Full Application	Added section vi. Impacted Indian Tribes Documentation (pg. 60)
IV. Application and Submission Information	D. Content and Form of the Full Application	Deleted and replaced xvi. Community Benefits Plan to the revised BIL xv. R&D Community Benefits Plan
IV. Application and Submission Information	D. Content and Form of the Full Application	Added instructions directing applicants to eXCHANGE for location of the SF-424 Application (Page 63)
IV. Application and Submission Information	D. Content and Form of the Full Application	Deleted from xv: Waiver Requests the waiver of the Buy America Requirement
IV. Application and Submission Information	D. Content and Form of the Full Application	Added Section xviii. Locations of Work
IV. Application and Submission Information	D. Content and Form of the Full Application	Added Section xix. Transparency of Foreign Connections submission requirement
IV. Application and Submission Information	D. Content and Form of the Full Application	Added Section xx. Potentially Duplicative Funding Notice
IV. Application and	E. Post Selection	Added Project Labor Agreement (PLA) to list of potential Post Selection Information Requests (Page 74)

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Submission Information	Information Requests	
IV. Application and Submission Information	I. Funding Restrictions	Added information regarding Davis-Bacon Act electronic payroll compliance software (viii. Davis Bacon Act Requirements, Page 82)
IV. Application and Submission Information	I. Funding Restrictions	Added xiv. Foreign Collaboration Considerations
V. Application Review Information	A. Technical Review Criteria	Added R&D Community Benefits Plan (CBP) Technical Review Criteria
V. Application Review Information	D. Evaluation and Selection Process	Updated iv. Recipient Responsibility and Qualifications to reflect transition from FAPIIS to SAM.gov (Page 95)
VI. Award Administration Information	A. Award Notice	Changed “iii. Successful Applicants” header to “iii. Applicants Selected for Negotiation” and made revisions to description information
VI. Award Administration Information	B. Administrative and National Policy Requirements	Added number of trainings and trainees placed in full-time employment to Reporting requirements (Section xiii, Page 103)
VI. Award Administration Information	B. Administrative and National Policy Requirements	Added xvii. Real Property and Equipment policy information (Page 105)
VI. Award Administration Information	B. Administrative and National Policy Requirements	Added to xxvii. Cybersecurity Plan recommendation standards, guidance on plan, and link to supplemental information on plan requirements

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I. Funding Opportunity Description

A. Background and Context

The Office of Energy Efficiency & Renewable Energy (EERE) is issuing this Funding Opportunity Announcement (FOA). Awards made under this FOA will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act,¹ more commonly known as the Bipartisan Infrastructure Law (BIL).

BIL is a once-in-a-generation investment in modernizing and upgrading American infrastructure to enhance U.S. competitiveness, drive the creation of good-paying union jobs, tackle the climate crisis, and ensure strong access to economic, environmental, and other benefits for disadvantaged communities.²³ BIL appropriates more than \$62 billion to the U.S. Department of Energy (DOE)⁴ to invest in American manufacturing and workers; expand access to energy efficiency and clean energy; deliver reliable, clean, and affordable power to more Americans; and demonstrate and deploy the technologies of tomorrow through clean energy demonstrations.

¹ Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021).

<https://www.congress.gov/bill/117th-congress/house-bill/3684>. This FOA uses the more common name [Bipartisan Infrastructure Law](#).

² Pursuant to E.O. 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, and the Office of Management and Budget's Interim Justice40 Implementation Guidance M-21-28 and Addendum M-23-09, DOE recognizes disadvantaged communities as defined the census tracts and identified as disadvantaged by the White House Council of Environmental Quality's Climate and Economic Justice Screening Tool (CEJST), located at <https://screeningtool.geoplatform.gov/>, as well as all Federally Recognized Tribes and Tribal entities (whether or not they have land). See https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf. DOE's Justice40 Implementation Guidance is located at <https://www.energy.gov/sites/default/files/2022-07/Final%20DOE%20Justice40%20General%20Guidance%20072522.pdf>.

³ Pursuant to E.O. 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, and the Office of Management and Budget's Interim Justice40 Implementation Guidance M-21-28 and Addendum M-23-09, DOE recognizes disadvantaged communities as the census tracts defined and identified by the White House Council of Environmental Quality's Climate and Economic Justice Screening Tool (CEJST), located at <https://screeningtool.geoplatform.gov/>, as well as all Federally Recognized Tribes (whether or not they have land). DOE's Justice40 Implementation Guidance is located at <https://www.energy.gov/sites/default/files/2022-07/Final%20DOE%20Justice40%20General%20Guidance%20072522.pdf>.

⁴ U.S. Department of Energy. November 2021. "DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver for American Workers, Families and Usher in the Clean Energy Future." <https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0>

DOE's BIL investments will support efforts to build a clean and equitable energy economy that achieves a zero-carbon electricity system by 2035, and to put the United States on a path to achieve net-zero emissions economy-wide by no later than 2050⁵ to benefit all Americans.

BIL will invest \$84,000,000 for the three-year period encompassing fiscal years 2022 through 2025 to support Enhanced Geothermal Systems (EGS) pilot projects that collectively demonstrate EGS in different geologic settings, using a variety of development techniques and well orientations, at sites where subsurface characterization or geothermal energy integration analysis has been conducted.

The activities to be funded under this FOA support BIL section 41007 (a). This section authorizes DOE Geothermal Technologies Office (GTO) to carry out activities under section 615(d) (Enhanced Geothermal Systems Demonstrations) of the Energy Independence and Security Act of 2007, as amended by the Energy Act of 2020 (42 U.S.C. 17194(d) (EISA 2007)). Pilot demonstration projects will enable investments that maintain progress towards GTO's aggressive *GeoVision*⁶ and EGS Energy Earthshot goals, and the broader government-wide approach to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower workers, and advance environmental justice.

i. Program Purpose

This FOA supports the administration goals laid out above by providing reliable and flexible, emissions-free electricity generation and delivering unique technology solutions to America's heating and cooling demands; directly supporting the Administration's goals of carbon pollution-free electricity by 2035 and net zero greenhouse gas (GHG) emissions by 2050. Geothermal resources can be found nationwide and represent vast domestic energy potential; however, only a fraction of this potential has been realized due to technical and non-technical barriers that constrain industry growth.

The Department of Energy's (DOE's) Geothermal Technologies Office's (GTO) 2022 Enhanced Geothermal Shot™ analysis, building on the 2019 GeoVision report, concludes that with aggressive technology improvements, in areas relevant to enhanced geothermal systems (EGS), geothermal power generation could provide 90 gigawatts-electric (GWe) firm, flexible power to the U.S. grid by 2050.

⁵ [Executive Order \(EO\) 14008](#), "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

⁶ The GeoVision Roadmap outlines a compilation of technical, economic, and institutional actions that the entire geothermal community including DOE, other government agencies, industry, and academia must address in order for geothermal technologies to play a larger role in the Nation's energy mix.

Enhanced Geothermal Systems (EGS) are engineered geothermal reservoirs, created where there is hot rock but little to no natural permeability and/or fluid saturation. During EGS development, subsurface permeability is enhanced via safe, well-engineered reservoir stimulation processes that re-open pre-existing fractures, create new ones, or a combination of both. These open conduits increase permeability and allow fluid to circulate throughout the hot rock. The fluid transports the otherwise stranded heat to the surface where clean, renewable electricity can be generated with current power generation technologies.

Relative to other geothermal resources, EGS have the potential to provide the most growth in the electric sector, and in the GeoVision scenarios, support noteworthy growth within the non-electric sector for district heating and other direct-use applications. This potential expands if superhot EGS resources (>375°C)⁷ are accounted for. Without significant and sustained investment in EGS technology development and demonstrations to refine our ability to access and develop these resources, however, the 90 GWe target will not be achieved.

BIL section 41007 (a). of the Bipartisan Infrastructure Law will enable investments that can maintain progress towards GTO's aggressive Energy Earthshot and GeoVision goals. The projects selected under this FOA will build on the lessons of previous GTO EGS demonstration initiatives, enabling a move beyond the near-field EGS environment with new drilling and development in varied geological environments to accelerate EGS commercialization pathways throughout the U.S.

The Topic Areas addressed under this FOA are:

Topic Area 1: EGS Proximal Demonstrations (CLOSED)

EGS demonstrations utilizing existing infrastructure proximal to existing geothermal / hydrothermal development with immediate potential for electrical power production.

Topic Area 2: EGS Green Field Demonstrations (CLOSED)

Sites with no existing geothermal development and potential for shallow sedimentary, igneous and/or mixed metamorphic rock EGS with near-term electrical power production potential.

Topic Area 3: Super-hot / Supercritical EGS Demonstrations (CLOSED)

Super-hot/ supercritical EGS demonstrations located at well-characterized sites with existing well(s) in place and with near-term electrical power production potential.

Topic Area 4: Eastern-US EGS Demonstrations (OPEN)

⁷ Bonneville, A., Asanuma, H., Cladouhos, T., Friðleifsson, G., Horne, R., Jaupart, C., Noren, A., Petty, S., Schultz, A., and Sorlie, C. (2021) "The Newberry Super-Hot EGS Project." Proceedings, World Geothermal Congress 2020+1, Reykjavik, Iceland, April – October 2021.

EGS stimulation demonstration located at a well-characterized Eastern U.S. site, with existing well(s) in place and near-term electrical **and/or thermal** power production potential.

As part of the whole-of-government approach to advance equity and encourage worker organizing and collective bargaining,^{8,9,10} and in alignment with BIL section 41007(a), this FOA and any related activities will seek to encourage meaningful engagement and participation of workforce organizations, including labor unions, as well as underserved groups and disadvantaged communities, including Federally Recognized Indian Tribes. Consistent with Executive Order 14008,¹¹ this FOA is designed to help meet the goal that 40% of the overall benefits of the Administration's investments in clean energy and climate solutions, along with other covered investment categories, be delivered to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution; as defined pursuant to the Executive Order, and to drive creation of accessible, good-paying jobs with the free and fair chance for workers to join a union.

ii. Technology Space and Strategic Goals

SEC. 41007 (a) of the Infrastructure Investment and Jobs Act authorized GTO to carry out activities under section 615(d) (Enhanced Geothermal Systems Demonstrations) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17194(d)) including \$84,000,000 for the period of fiscal years 2022 through 2025. This legislation authorizes GTO to support enhanced geothermal systems pilot projects that collectively demonstrate EGS in different geologic settings, using a variety of development techniques and well orientations, at sites where subsurface characterization or geothermal energy integration analysis has been conducted.

⁸ EO 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government," January 20, 2021. EO 14091, "Further Advancing Racial Equity and Support for Underserved Communities Through the Federal Government," February 16, 2023.

⁹ EO 14025, "Worker Organizing and Empowerment," April 26, 2021.

¹⁰ EO 14052, "Implementation of the Infrastructure Investment and Jobs Act," November 18, 2021.

¹¹ EO 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

The pilot demonstrations enabled via this FOA will help fill an important gap that exists in global technology markets and innovation systems. Overcoming the frequently cited 'valley of death,' where countless promising early-stage technology concepts fail (Figure 1), remains a challenge as a result of the high-risk nature of initial scale-up in conjunction with uncertain markets. This leads to underinvestment¹² because the financing required for commercial deployment is not available from low-cost institutional capital sources without first de-risking technology at scale¹³.

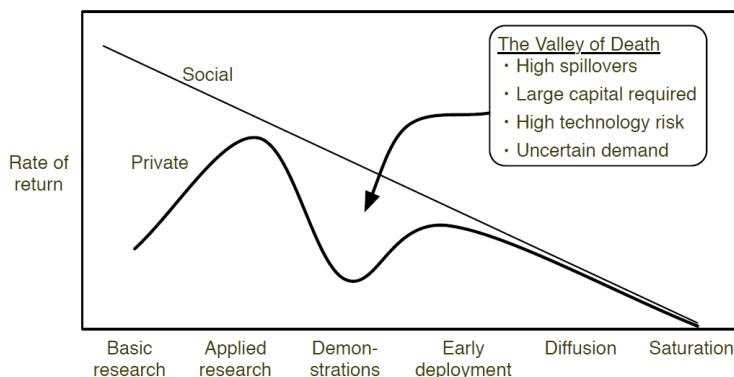


Figure 1: Innovation Stages and the Valley of Death (Nemet, Kraus and Zipperer, 2016)

Adding additional complication, demonstration projects require a variety of technologies working in conjunction, many of which are not considered commercial^{14 15 16 17}. Demonstrations also require significant funding for scale-up and are dependent upon external factors including supply chains, employment of engineering standards, successful local and federal permitting, environmental reviews and impact assessments, and stakeholder engagement. The combination of these factors often creates significant risk for project failure. In addition, the reality of innovation is that although the process is superficially linear--progressing from early-stage lab work to commercial-scale market deployment--each step within the innovation process involves feedback loops¹⁸ which require time and iteration to successfully advance through.

¹² [Nemet, Kraus and Zipperer, The Valley of Death, the Technology Pork Barrel, and Public Support for Large Demonstration Projects. German Institute for Economic Research. 2016.](#)

¹³ <https://www.forbes.com/sites/brentanalexander/2021/11/06/the-new-infrastructure-bill-looks-to-solve-a-clean-energy-valley-of-death/?sh=40c171d42b91>

¹⁴ Gordon Kingsley, Barrt Bozeman, and Karen Coker. Technology transfer and absorption: an r&d value-mapping approach to evaluation. *Research Policy*, 25(6):967-995, 1996.

¹⁵ David C. Mowery. The changing structure of the us national innovation system: implications for international conflict and cooperation in r&d policy. *Research Policy*, 27(6):639-654, 1998.

¹⁶ P. Spath and H. Rohracher. 'energy regions': The transformative power of regional discourses on socio-technical futures. *Research Policy*, 39(4):449-458, 2010. ISSN 0048-7333.

¹⁷ Chris Hendry and Paul Harborne. Changing the view of wind power development: More than bricolage". *Research Policy*, 40(5):778-789, 2011.

¹⁸ Kerssens-van Drongelen, I., Bilderbeek, J., 1999. R&D performance measurement: more than choosing a set of metrics. *R&D Management*. 29, 35-46.

The learnings and objectives of pilot demonstrations can be summarized as follows:

- as exemplars, proving reliability and performance ultimately de-risking the technologies;
- as experiments from which to learn, because upscaling typically identifies new problems that are not apparent at smaller scales¹⁹ and allows the community to settle on a ‘dominant’ design²⁰;
- as opportunities for collaboration, such that best practices can be established, and processes can be standardized and improved.

Researchers focused on progressive learning across renewable and sustainable energy demonstration projects^{21 22} identify the importance of **technical learning** to first iterate on improvements to technologies involved in full-scale demonstrations and subsequent **organizational and market learnings** where applying technical learning curve benefits leads to scale-up, operational processes, and the development of market niches as well as improved effectiveness and efficiency (Figure 2).

¹⁹ Devendra Sahal. Technological guideposts and innovation avenues. *Research Policy*, 14(2):61-82, 1985.

²⁰ Brown J, Hendry C. Public demonstration projects and field trials: accelerating commercialization of sustainable technology in solar photovoltaics. *Energy Pol* 2009;37(7):2560–73.

²¹ Bart A.G. Bossink. Learning strategies in sustainable energy demonstration projects: What organizations learn from sustainable energy demonstrations. *Renewable and Sustainable Energy Reviews*, 131: 110025, 2020. ISSN 1364-0321

²² Bart A.G. Bossink, Demonstrating sustainable energy: A review-based model of sustainable energy demonstration projects, *Renewable and Sustainable Energy Reviews*. 77: 1349-1362, 2017. ISSN 1364-0321.

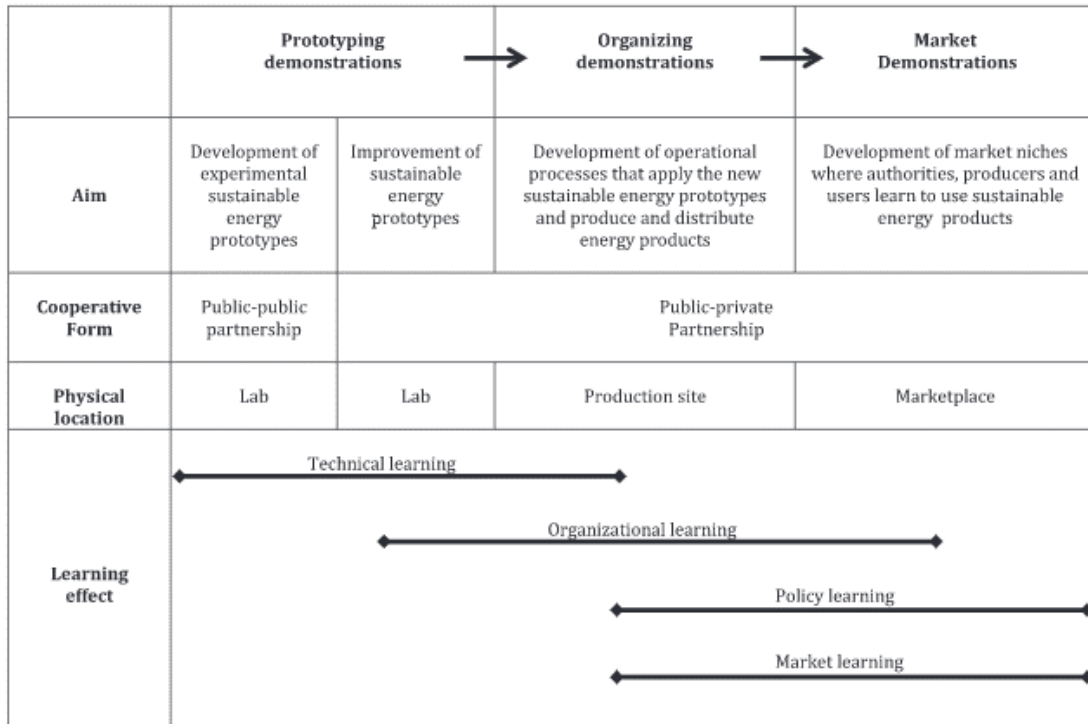


Figure 2: Model of renewable and sustainable energy demonstration project learning (Bossink, 2017)

With respect to the specific intent of this FOA, Technical Learning may include:

- Identification and descriptions of actions by which the proposed subsurface technologies or methodologies will be advanced (e.g., best technical practices, operational lessons learned, subsequent technological refinements, etc.).

Similarly, Organizational Learning specific to this FOA may include, but is not limited to:

- A plan for hypothesis testing or learning-by-doing, developing, and refining in-the-field operational strategies that improve the efficiency and repeatability of EGS deployment.
- Identification and description of all relevant stakeholders.

Market Learning specific to this FOA may include, but is not limited to:

- For projects proposing electrical power generation, estimates of power production capacity from the proposed field demonstration.
- For projects proposing thermal power production, estimates of thermal power potential from the proposed field demonstration.

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- Consideration and analysis of the size of the potential market opportunity (i.e., Local and regional electricity demands and local and regional heating demands).
 - Overview of commercial, environmental, and community/societal benefits. Critical questions to address can include:
 - Who benefits from the project and how/why?
 - What are the non-monetary benefits of the project? For whom?
 - How can we facilitate the use of geothermal energy by these potential beneficiaries and engender a positive view of geothermal?
 - Characterization of existing grid and transmission infrastructure and identification of potential grid/transmission connection points.
 - Current Market Intelligence identifying recent analogous Power Purchase Agreements (PPAs), land acquisition costs, analogous permitting timelines.
 - Project-Level Economic Analyses (e.g., Levelized Cost of Electricity (LCOE)), cash flow analysis, net present value, return on investment).
 - Operating expenses required to maintain reliable and sustainable power production.
 - Go-To-Market Strategies Understanding of the size of the potential market opportunity (i.e., Local and regional electricity demands and local and regional heating demands).
 - Estimated economic impacts of quantifiable risks, where applicable.

Government supported pilot demonstrations focused on technical and organizational learning, which are the objective of this FOA, provide a unique opportunity to address the pilot demonstration objectives outlined above with low risk. Given the opportunity to learn-by-doing during these supported demonstrations and ultimately standardize technical strategies, projects are then ideally positioned to advance to the next critical pre-commercialization step, creating and learning about their market, which enables commercial deployment at scale supported by private financing.

The most fundamental advancement required to enable EGS commercialization at scale is permeability enhancement that optimizes heat transfer to generate sustainable power. A multitude of technologies exist and are under development that address challenges to accessing, creating, and sustaining EGS reservoirs. However, processes to develop orderly and strategic permeability enhancement methods--controlling fracture location, shape, and size, for example--cannot be perfected in a lab, but instead require subsurface access, and testing in real world temperature, stress, and pressure conditions in various lithologies. Few of these prototyped technologies or methods have enjoyed opportunities to test in situ from a systems perspective, in different combinations, and under a variety

of geologic settings and conditions. The lack of opportunities for field-based, iterative, EGS testing exists because of the high costs of subsurface operations, including drilling and stimulating wells. As a result, a menu of mid Technology Readiness Level (TRL) reservoir creation and characterization technologies stand ready along with decades of computational modeling expertise waiting for hypothesis testing in the field to prove their reliability.

Learning-by-doing will enable technology suites to be upscaled, and the collaborative development of accepted design approaches in different environments that can be adopted for broader EGS development.

As outlined above, the invaluable opportunity to learn-by-doing and innovate EGS systems at pilot scale can lead to equally transformative changes in deployment and acceptance of EGS nationwide.

Detailed technical descriptions of the specific Topic Areas are provided in the sections that follow.

iii. Teaming Partner List

DOE is compiling a Teaming Partner List to facilitate the formation of project teams for this FOA. The Teaming Partner List allows organizations that may wish to participate on a project to express their interest to other applicants and explore potential partnerships.

The Teaming Partner List will be available on EERE eXCHANGE and will be regularly updated to reflect new teaming partners who provide their organization's information.

SUBMISSION INSTRUCTIONS: View the Teaming Partner List by visiting the EERE eXCHANGE homepage and clicking on "Teaming Partners" within the left-hand navigation pane. This page allows users to view published Teaming Partner Lists. To join the Teaming Partner List, submit a request within eXCHANGE. Select the appropriate Teaming Partner List from the drop-down menu, and fill in the following information: Investigator Name, Organization Name, Organization Type, Topic Area, Background and Capabilities, Website, Contact Address, Contact Email, and Contact Phone.

DISCLAIMER: By submitting a request to be included on the Teaming Partner List, the requesting organization consents to the publication of the above-referenced information. By facilitating the Teaming Partner List, DOE is not endorsing, sponsoring, or otherwise evaluating the qualifications of the individuals and organizations that are identifying themselves for placement on this Teaming Partner List. DOE will not pay for the provision of any information, nor will it

compensate any applicants or requesting organizations for the development of such information.

B. Topic Areas

GTO's EGS Program actively pursues research, development, and demonstration projects to facilitate technology validation and demonstration, reduce cost, and improve performance of EGS. Specifically, the economic viability of EGS depends on developing and improving enabling technologies and a detailed understanding of rock mass behavior and permeability enhancement.

The pilot demonstration activities to be funded through this FOA will advance the Biden Administration's goals to achieve carbon pollution-free electricity by 2035 and "deliver an equitable, clean energy future, and put the United States on a path to achieve net-zero emissions, economy-wide, by no later than 2050 to the benefit of all Americans by driving innovation at field scale. The Department of Energy is committed to pushing the frontiers of science and engineering, catalyzing clean energy jobs through research, development, demonstration, and deployment (RDD&D), and ensuring environmental justice and inclusion of disadvantaged communities.

The objective of this funding opportunity announcement is to identify and develop EGS pilot demonstration projects in a variety of geologic formations and subsurface conditions that will act:

- **as exemplars, proving reliability and performance ultimately de-risking the suites of technologies required to develop and sustain EGS reservoirs;**
- **as experiments from which to learn (Learn-by-doing), to use the upscaled opportunity to identify new problems that are not apparent at smaller, lab-based scales;**
- **as an opportunity to hypothesis test and validate a design approach for the geological conditions where projects are located and extended to broader EGS development;**
- **as opportunities for collaboration, such that best practices can be established, and general operational processes can be standardized and improved;**
- **(In Topic Area 2, 3, 4) as opportunities to begin to connect with consumers and off-takers, to understand their needs and define the**

market, and take that into account in design (including specific DOE interest in EGS for load following generation, where relevant).

<u>Topic Areas</u>	<u>Title</u>
BIL section 41007(a) Enhanced Geothermal Systems Pilot Demonstrations	
Topic Area 1: EGS Proximal Pilot Demonstrations (CLOSED)	EGS demonstrations utilizing existing infrastructure proximal to existing geothermal / hydrothermal development with immediate potential for electrical power production.
Topic Area 2: EGS Green Field Pilot Demonstrations (CLOSED)	Well-characterized sites with no existing geothermal development and potential for sedimentary, igneous and/or mixed metamorphic rock EGS with near-term electrical power production potential.
Topic Area 3: Super-hot / Supercritical EGS Pilot Demonstrations (CLOSED)	Super-hot/ Supercritical EGS demonstrations located at well-characterized sites with near-term electrical power production potential.
Topic Area4: Eastern-US EGS Pilot Demonstration ²³ (OPEN)	EGS demonstration located at a well-characterized Eastern U.S. site with near-term electrical and/or thermal power production potential.

All work for projects selected under this FOA must be performed in the United States. See Section IV.I.iii. and Appendix C.

This FOA may remain open for up to 48 months, with review cycles occurring approximately every eight months, while funding lasts. The “rolling” nature of this announcement is meant to accommodate our community of applicants, who may need time to find the appropriate mix of experience to develop effective teams and to identify high potential sites, perform critical due diligence on those sites, and accommodate operational restrictions on sites before applying. In addition, DOE recognizes a perennial challenge for our small industry with respect to the availability of personnel to commit to the DOE FOA application and project management process. Although it is anticipated that additional annual appropriations will be made available for this FOA in subsequent years and that funding will remain available for additional launches of this FOA, it cannot be guaranteed.

Please note that appropriated funding may be expended after the 2nd Cohort selections are made. If this is the case, DOE will notify the community via EERE eXCHANGE that subsequent submission periods will be withdrawn.

²³ EASTERN DEMONSTRATION per Congressional language is defined as “an area east of the Mississippi River that is suitable for enhanced geothermal demonstration for power, heat, or a combination of power and heat. “

Strategic Goals:

The technology developments targeted in this FOA are intended to increase geothermal power production in the U.S. in the near-term from areas surrounding existing geothermal fields (Topic Area 1) while facilitating new opportunities for widespread **electrical power, electrical power with cascaded heat production, or thermal power production** in the future from regions where heat is present, yet no geothermal energy production exists (i.e., Topic Areas 2, 3, 4).

Strategic goals for this FOA, highlighted below in Table 1, are derived from the Enhanced Geothermal Systems Energy Earthshot, the GeoVision Roadmap and GTO MYPP.

Table 1: BIL EGS Demonstrations FOA Goals and Applicable GTO Goals

FOA Metrics:

- Topic Areas 1, 2 and 3 must demonstrate the modeled or actual capability of producing >5 MWe of additional capacity (per site/well) using advanced stimulation techniques in new/existing geothermal wells.
- For Topic Area 4 demonstrate the capability of producing > 1 MWe **and/or** 3 MWth. Demonstration of the advancement of a critical reservoir creation technology or method to a higher TRL.

Enhanced Geothermal Shot™	\$45/MWh by 2035 Aggressive pursuit of resource characterization, well construction, reservoir sustainability, and materials R&D accompanied by a “learn-by-doing” approach to EGS field demonstration testing.
<u>GeoVision Roadmap</u>	SUB-ACTION 1.4.1: Develop existing and innovative stimulation methods for improved geothermal resource recovery SUB-ACTION 1.4.2: Improve zonal-isolation techniques. SUB-ACTION 1.4.3: Develop advanced real-time fracture modeling and mapping. SUB-ACTION 1.4.4: Quantify the relationship among in-situ state of stress, induced seismicity, and permeability
GTO MYPP 2022	Subsurface Enhancement and Sustainability Goal 1: Collect, archive, and distribute high-fidelity multiphysics data associated with stimulations of in-field, near-field, and greenfield EGS reservoirs in crystalline rock at depth Subsurface Enhancement and Sustainability Goal 2: Increase the net production potential in an existing geothermal plant using advanced, targeted stimulation technologies in existing but sub-commercial wells Subsurface Enhancement and Sustainability Goal 4: Refine and optimize stimulation procedures using zonal isolation for reservoir enhancement in crystalline basement rock

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Pilot Demonstration Requirements: (RELEVANT TOPIC AREAS are NOTED):

Awards made under this funding opportunity announcement will be cooperative agreements that may include drilling, well stimulation, data collection, modeling, and analysis. Power production is allowable, if feasible.

- **Compliance with the “Protocol for Induced Seismicity Associated with Enhanced Geothermal Systems,” (REQUIRED FOR ALL TOPIC AREAS):**

<http://wellbore.lbl.gov/downloads/EGS-IS-Protocol-Final-Draft-20120124.PDF>

This document is intended to serve as a general guide that identifies steps a geothermal developer can take to address induced seismicity issues. The proposed protocol includes simple planning steps that would apply to most developments, as well as more elaborate procedures that would apply under particular circumstances to a small number of geothermal developments. Therefore, this protocol is not intended to be a universal prescriptive approach to seismicity management. The guiding principles shall be incorporated into the management of all EGS Pilot Demonstration awards.

- **Drilling, Recompletion, and Workover Costs (REQUIRED FOR ALL TOPIC AREAS)**

While permeability enhancement is a requirement and is the focus of these pilot demonstrations, it is recognized that some funds may be needed by project applicants for well construction, recompletion, or workover activities to enable effective reservoir stimulation.

Recipients of funding from this FOA will be allowed to expend 50% of the awarded funds toward well drilling and/or refurbishment in support of the demonstrations. The funds allocated for drilling, recompletion, and workover are limited to activities that involve the drilling of a new well(s) or operations in an existing well(s) through the installation and cementing of the final casing string or liner or any equipment or tools deployed as part of the final casing string or liner (e.g. external casing packers, sliding sleeves, and the like). Well costs in excess of those covered by this FOA will be the responsibility of the applicant and can be applied to the requisite cost share.

Additionally well-related costs incurred prior to an award are the responsibility of the applicant as are any other well costs not directly associated with the project.

Details of any planned well construction or workover activities and associated costs must be submitted in the application. Recipients under this FOA will be required to provide updated/final well construction or workover plans for review and approval by DOE prior to initiation of such activities during Phase 1.

- **Communications (REQUIRED IN ALL TOPIC AREAS)**

Recipients must reserve a portion of their budget to conduct and promote communications and outreach activities with stakeholders, including labor unions and the general public to listen to concerns, provide details on their project plans, and share their successes. Engagement with local stakeholders must begin at the outset of any selected projects and must be maintained on a recurring basis throughout the duration of the project.

DOE requires that each team recruit and maintain (full or part time, depending on need) an “information officer” whose role will center around engagement with the local community to ensure there is a direct conduit for information on the projects.

- **Workforce (REQUIRED IN ALL TOPIC AREAS)**

- **Data Collection:** The Geothermal workforce is everchanging, with skilled workers from oil and gas or other industries frequently transitioning into geothermal depending on market conditions and project availability. DOE would like to take the opportunity to collect critical data on the Knowledge, Skills, and Abilities (KSAs) required of the workforce for successful execution of these Pilot Demonstration Projects. Recipients will be asked to submit a record of occupations of workers that are participating in the project on a quarterly basis which will be used to inform a specific end of project task that will identify KSAs and core competencies of workers necessary to complete EGS demonstration projects.
- **Workforce Opportunities:** Pilot demonstration leads will be asked to host one “graduate” of future GTO/GEODE developed workforce programs (if applicable, pending appropriations for these other programs, and at no cost to the pilot demonstration) to create a pipeline for newly trained geothermal professionals from geoscientists and engineers, land management professionals, to drillers, rig hands, service providers, etc., to enter the geothermal market.

- **Teaming (REQUIRED IN ALL TOPIC AREAS)**

This FOA seeks to solicit multi-disciplinary teams that have the demonstrated technical and financial viability to plan, develop, and operate large-scale field-based EGS and Superhot EGS projects with minimum variance from the originally planned project schedule, scope, and budget.

Principal Investigators must reserve a developmental position on their team for aspiring PIs (junior faculty from Academia, early career National Laboratory research staff, junior industry researchers etc.) to gain invaluable mentorship experience during the execution of a large-scale demonstration project. This position can take any form deemed appropriate by the PI(s) but must provide access to project leadership and

project management decision-making. Projects undertaking construction activity are encouraged to team with the appropriate building and construction trades unions and provide letters of commitment.

Teams are required to include industry participation and should focus on diversity of personnel, institutions, expertise and sector knowledge. Teams must include geothermal expertise but can include a diversity of experience from other subsurface relevant sectors as well.

The Teaming list can be utilized (<https://eere-exchange.energy.gov/>) to assist in creating effective, multi-disciplinary teams.

- **Reservoir Stimulation (REQUIRED IN ALL TOPIC AREAS)**

Pilot demonstration projects funded under this FOA will be expected to identify and deploy innovative and in some cases, pre-commercial, technologies to enable in situ reservoir monitoring and assessment, reservoir stimulation, monitoring flow testing, and, potentially, electrical and/or thermal power production.

Due to the criticality of permeability enhancement in EGS, all projects except Topic Area 3 must successfully demonstrate and execute multi-zone stimulation methods and techniques. For Topic Area 3, the demonstration and execution of multi-zone stimulation methods and techniques is desired but not required, but stimulation of at least one zone is required (e.g. fluid injection through casing to stimulate an open-hole section below the final casing string would be acceptable). In addition, these projects must identify a pathway to successfully sustain sufficient fluid flow and heat extraction rates commensurate with that required for commercial development, which directly supports the Biden Administration's goals for a clean energy future.

As such, field-based pilot scale demonstrations funded through this FOA in Topic Areas 1, 2 & 4 will be required to utilize advanced reservoir stimulation and isolation technologies, which are identified in the Strategic Development of EGS²⁴ and FORGE Roadmaps²⁵, as central to the success of EGS. Pilot scale demonstrations in Topic Area 3 will be required to execute a reservoir stimulation but are not required to deploy advanced technologies that enable stimulation and isolation across multiple zones (e.g., open-hole stimulation below the last casing shoe would be acceptable).

Publicly released information regarding previous DOE field projects and technical baseline for well stimulation methods utilized in the past can be found at

²⁴ Zlagos, J., Phillips, B.R., Boyd, L., et al. "A Technology Roadmap for Strategic Development of Enhanced Geothermal Systems." *Proceedings of Thirty-Eighth Workshop on Geothermal Reservoir Engineering (2013)*.

²⁵ McKittrick, Alexis, Leslie Abrahams, Christopher Clavin, Robert Rozansky, and Daniel Bernstein. *Frontier Observatory for Research in Geothermal Energy: A Roadmap*. IDA Science and Technology Policy Institute, 2019

<https://www.osti.gov/> (i.e., final technical reports, conference proceedings, journal articles, and the like), and <https://www.energy.gov/eere/geothermal> (GTO EGS information and GTO Peer Review reports). These demonstration projects dramatically advanced EGS research, but repeated testing to demonstrate the reproducibility of field-scale EGS stimulation methods has not been possible and therefore technical questions remain, surrounding:

- Sufficient technical understanding of factors that contribute to success or failure of well stimulation methods in a variety of geothermal reservoirs and rock types
- Sufficient testing of various well stimulation techniques that utilize various combinations of technologies and methods such as fluid injection, thermal rock-fluid interaction, chemical stimulation, zonal isolation, addition of proppants, and/or other techniques
- Adoption of successful EGS well stimulation techniques by the geothermal industry at a commercial scale

Several new technologies or those adopted from the oil and gas sector have shown promise for improving stimulation success and sustainability in EGS wells. In addition, a shift in the rationale surrounding EGS stimulation strategy – progressing from open-hole stimulation to isolated stimulation zones - has occurred in the last decade and has shown clear advantages in modeling²⁶ and field tests (e.g., Cladouhos et al, 2009)²⁷. GTO seeks to leverage these advances to generate power **and heat** in the near-term, from non- or under-performing wells on the margins of hydrothermal fields (Topic Area 1), where infrastructure costs are low and Megawatts (MW) can be added now as well as in new environments where lower EGS costs can be achieved with the implementation of multiple stimulation zones (i.e., Topic Areas 2 and 4).

- **Consideration and documentation of Technical, Organizational, and Market Learning (REQUIRED IN ALL TOPIC AREAS)**

Applicants and awardees will be required to consider and document opportunities for technical and organizational learning in their application materials and to describe learnings in Phase Reports throughout the project duration.

Technical Learning could include the identification and descriptions of actions by which the proposed subsurface technologies or methodologies will be advanced (e.g., best

²⁶ Kennedy, B.M, D. Blankenship, T. Doe, A. Riahi, P. Fu, B. Damjanac, E. Sonnenthal, A. Finnilla, 2021, Performance Evaluation of Engineered Geothermal Systems Using Discrete Fracture Network Simulations, Lawrence Berkeley National Laboratory, <https://escholarship.org/uc/item/4168d73x>

²⁷ Cladouhos, T., Petty, S., Larson, B., Ivonetti, J., Livesay, B., Baria, R. 2009, Toward More Efficient Heat Mining: A Planned Enhanced Geothermal System Demonstration Project, GRC Transactions, Vol. 33.

technical practices, operational lessons learned, subsequent technological refinements, etc.) or other areas of relevance.

Similarly, Organizational Learning specific to this FOA could include a clear methodology for hypothesis testing or learning-by-doing, identification of relevant stakeholders, developing in-the-field operational strategies that improve the efficiency and repeatability of EGS deployment or other topics that advance organizational learnings. With respect to Market Learning, economic and social benefits, market potential, infrastructure (e.g., existing transmission), and go-to-market strategies should be articulated and project-level economic analyses, where relevant, presented quantitatively.

TOPIC AREA DETAILS:

Topic Area 1: EGS Proximal Demonstrations (CLOSED)

EGS demonstrations utilizing existing infrastructure proximal to existing geothermal / hydrothermal development with immediate potential for electrical power production.

Objective: Through this Topic Area, innovative stimulation techniques and technologies must be validated in the field, culminating in new, clean, baseload geothermal power production. A continuation of the 2020 GTO Amplify effort, this Topic Area will demonstrate that the use of EGS stimulation methods can transform low permeability or underproductive wells in or near existing hydrothermal fields into productive, economically beneficial assets for geothermal developers. **These demonstrations will focus on technical and organizational learning.** Applicants should closely consider the Objectives outlined in Section I.A. in defining their proposed project approach and opportunities to learn-by-doing.

The awards funded under this FOA Topic Area will stimulate wells with sub-commercial production / injection capacity in a near-field or in-field environment with the goal of sustainably increasing the output of the existing reservoirs by at least 5MW per site/well.

Technical Requirements: Awardees will develop a plan to enhance the productivity of the system, then stimulate one or more wells and monitor the improvement in productivity or injectivity of the system (power production). These projects will advance the state-of-the-art in EGS development and build on successes of previous DOE EGS demonstration projects via the use of targeted stimulation techniques such as zonal isolation, fracture initiation technologies for improving productivity of wells and/or increasing inter-well connectivity. The use of readily field-deployable well stimulation techniques that target specific sections of wells (via zonal isolation) is required. The use of available or tested prototype technologies from geothermal,

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oil and gas, or other relevant industries are allowable but the Technology Readiness Level (TRL) of proposed stimulation/isolation technologies must be at least a six (6). It is the intent of this pilot demonstration that technologies only be deployed that have been tested in relevant environments and applicants must provide rigorous and thorough documentation of such in their applications. Please see Appendix E for TRL definitions.

Awards made under this announcement will be in the form of cooperative agreements that will include well stimulation, data collection, power production, modeling, and analysis during three distinct Phases.

Drilling and Site Requirements:

It is preferred that at least one target well exists at any proposed sites prior to an award being made by DOE under this announcement, but it is not a requirement. For applications where a target well does not exist or where additional wells are proposed, only that portion of the award discussed above in the drilling requirements section, can be applied to well construction activities. For sites with existing wells, DOE seeks wells that are in good condition and capable of being put into operations relatively quickly and with minimal workover, subject to the funding restrictions noted previously. Applicants who propose sites without existing target wells are encouraged to apply only if sufficient site-specific geologic characterization and analysis has taken place as specified in 42 U.S.C. 17194(d) (the level of data available will be reviewed as part of the Merit Review Process) and if a well location has already been selected. Additionally, if a new well is proposed, the applicant must describe in sufficient detail that the new well is not targeting a prime hydrothermal resource and the drilling activities must incorporate technology advancements aimed at reducing well construction time and costs compared to other wells drilled in the field. Specific requirements for new drilling are included in the Project Phase Descriptions. A new well may be drilled as part of this Topic Area, however, **operators should note that drilling costs must be repaid to DOE if a commercial hydrothermal resource is identified and accessed during drilling.** For this FOA, a commercial hydrothermal resource is defined as a well that has a capacity of generating 3 MWe or greater without any reservoir stimulation or enhancement, as confirmed by appropriate well testing.

Please note that extensive site characterization work will NOT be funded under this FOA although it is allowable as recipient cost-share.

Under this Topic Area, projects with existing permits or a clearly outlined and pre-positioned pathway to securing permitting will be given preference during the Merit Review Process. The Applicant or partners must provide sufficient legal documentation to demonstrate that they have the legal surface and subsurface rights necessary for geothermal resource extraction at the proposed site at the time of application or must provide clear documentation that surface and subsurface rights for geothermal resource extraction can be obtained within the timeframe of Phase 1 of the project. Letters of support from partners or subcontractors do not take the

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place of legal documentation of surface and subsurface rights.²⁸ It is a requirement that the site be within or proximal to a producing hydrothermal field and that an operational and accessible power plant exist near the location of the proposed well(s).

Costs to develop pipelines to reach said operational power plant must be outlined in the application materials and must be paid for by the project team. A higher priority will be given to proposals that identify wells that, if successfully stimulated, will require lower costs for access to power facilities or provide higher cost share for the development of required infrastructure to produce power, if applicable (pipelines, pipeline connections, etc.).

It is the expectation that the Project Level Economic Analysis as well as other aspects of Technical, Organizational and Market Learning will be further developed and updated by awardees under this FOA throughout the phases of the projects.

Applicants **must include a preliminary but thorough analysis of electrical power potential, prior to, and following the planned permeability enhancement activities** as part of their Application's Technical Volume.

Topic Area 2: EGS Green Field Demonstrations (CLOSED)

Sites with no existing or proximal geothermal development and potential for sedimentary, igneous and/or mixed metamorphic rock EGS with near-term electrical power production potential.

Objective: EGS Green Field Demonstrations will target low permeability, geothermal anomalies with the *potential* for power production, where no current geothermal development exists. **These demonstrations will focus on technical, organizational, and market learning.** They will be required to utilize innovative stimulation techniques and technologies to continue to hone our understanding of what is required, especially with respect to zonal isolation and stimulation, to scale up EGS and ensure its viability throughout the U.S. Applicants should closely consider the Objectives outlined on page 7 of the Background section in defining their proposed project approach and opportunities to learn-by-doing.

Technical Requirements: This Topic Area will facilitate development in well-characterized sedimentary, igneous and/or mixed metamorphic reservoirs without regard to geographic location within the United States. Further, this Topic Area will provide an opportunity to refine our understanding of the extent of EGS resources available for new, clean, baseload geothermal power production.

²⁸ For projects on federal land, legal documentation may include a BLM lease, BLM site license, BLM exploration permit, BLM drilling permit, and a BLM utilization permit. For projects on private/state land, legal documentation may include: a deed or lease for the geothermal rights (as defined in that state), a similar document showing surface rights, and drilling & operating permits.

Applicants can consider a variety of development techniques to effectively access and create a productive EGS reservoir in designing their projects, including: unique completions, well orientations relative to in situ stress, stimulation and zonal isolation technology or methods. The use of available or tested prototype technologies from geothermal, oil and gas, or other relevant industries are allowable but the Technology Readiness Level (TRL) of proposed stimulation/isolation technologies must be at least a six (6). It is the intent of this pilot demonstration that proposed technologies have been tested in relevant environments and applicants must demonstrate as such in their applications. Please see Appendix E for TRL definitions.

Proposed sites/reservoirs should, per 42 U.S.C. 17194(d)), include sites where “subsurface characterization or geothermal energy integration analysis has been conducted” and in “locations that are potentially commercially viable for enhanced geothermal systems development, while also considering environmental impacts to the maximum extent practicable.” Rigorous and thorough technical documentation of such characterization and integration analyses must be provided by the Applicant in the submitted Technical Volume of the application. Extensive site characterization work will not be funded under this FOA although it is allowable as recipient cost-share.

Awards made under this announcement will be cooperative agreements that will include drilling, well stimulation, data collection, power production (if feasible), modeling, and analysis.

Drilling and Site Requirements:

The value of information obtained from wellbores drilled in new or frontier areas is inherently high and provides a primary basis for confirmation of the potential for any new EGS resource. As such, at least one well which has been drilled to and has encountered the target reservoir at proposed site(s) would be preferred prior to an award being made by DOE under this announcement, although this is not a requirement. For applications where a target well or wells do not exist or where additional wells are proposed, only that portion of the award discussed above can be applied to well construction activities. For sites with existing wells, DOE seeks wells that are in good condition and capable of being put into operations relatively quickly and with minimal workover, subject to the funding restrictions noted previously. Applicants who have proposed sites without existing target wells are encouraged to only apply if sufficient site-specific geologic characterization and analysis has taken place as specified in 42 U.S.C. 17194(d) (the level of data available will be reviewed as part of the Merit Review Process) and if well location(s) has already been selected. Additionally, if a new well or wells are proposed, the applicant must describe in sufficient detail that the new well(s) is not targeting a prime hydrothermal resource and the drilling activities must incorporate technology advancements aimed at reducing well construction time compared to nearby offset wells or wells of a similar nature. Specific requirements for new drilling are included in the Project Phase Descriptions.

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subject line.*

If a new well(s) is proposed, **operators should note that drilling costs must be repaid to DOE if a commercial hydrothermal resource is identified and accessed during drilling.** For this FOA, a commercial hydrothermal resource is defined as a well that has a capacity of generating 3 MWe or greater without any reservoir stimulation or enhancement, as confirmed by appropriate well testing.

Under this Topic Area, projects with existing permits or a clearly outlined and pre-positioned pathway to securing permitting will be given preference during the Merit Review Process. The Applicant or partners must provide sufficient legal documentation to demonstrate that they have the legal surface and subsurface rights necessary for geothermal resource extraction at the proposed site at the time of application or must provide clear documentation that surface and subsurface rights for geothermal resource extraction can be obtained within the timeframe of Phase 1 of the project. Letters of support from partners or subcontractors do not take the place of legal documentation of surface and subsurface rights.²⁹

Although power production is not a requirement, it is an encouraged outcome, albeit beyond the scope/funding available through this FOA. Applicants **must include a preliminary but thorough analysis of electrical power potential, prior to, and following the planned permeability enhancement activities** as part of their Application's Technical Volume.

Topic Area 3: Super-hot/Supercritical EGS Demonstration (CLOSED)

Super-hot/ Supercritical EGS demonstrations located at well-characterized sites with near-term electrical power production potential.

Objective: This Topic Area targets low permeability, super-hot / supercritical EGS resources (>375°C) with the *potential* for power production. **These demonstrations will focus on technical, organizational, and market learning.** Super-hot / Supercritical Demonstrations will be required to improve our understanding of the mechanisms controlling fracture generation and sustainability in superhot environments and elucidate the relationships between reservoir permeability, fluid chemistry, temperature, and pressure. **Applicants should closely consider the Objectives outlined on page 7 of the Background section in defining their proposed project approach and opportunities to learn-by-doing.**

Technical Requirements: This Topic Area will facilitate EGS development in well characterized, super-hot/supercritical reservoirs, regardless of subsurface geologic setting by providing an opportunity to refine our understanding of the unique and high potential super-

²⁹ For projects on federal land, legal documentation may include a BLM lease, BLM site license, BLM exploration permit, BLM drilling permit, and a BLM utilization permit. For projects on private/state land, legal documentation may include: a deed or lease for the geothermal rights (as defined in that state), a similar document showing surface rights, and drilling & operating permits.

hot/supercritical EGS resources available for new, clean, baseload geothermal power production.

Applicants can consider a variety of development techniques to effectively access and create a productive reservoir in super-hot/supercritical environments, including: unique well designs, completions, wellbore orientations, reservoir stimulations, and zonal isolation technology or methods, however, this Topic Area DOES NOT REQUIRE multizone stimulation (e.g., open-hole stimulations below the last cemented casing string are acceptable). Instead, the focus is on earlier stage understanding of the subsurface environment and how stimulation will alter that environment.

If multizone stimulation is proposed, the use of available or tested prototype technologies from geothermal, oil and gas, mining, or other relevant industries are allowable but the TRL of proposed stimulation/isolation technologies must be at least a six (6). It is the intent of this pilot demonstration that proposed technologies have been tested in relevant environments and applicants must demonstrate as such in their applications. Please see Appendix E for TRL definitions.

Proposed sites/reservoirs should, per 42 U.S.C. 17194(d)), include sites where “subsurface characterization or geothermal energy integration analysis has been conducted” and in “locations that are potentially commercially viable for enhanced geothermal systems development, while also considering environmental impacts to the maximum extent practicable.” Extensive characterization work to assess the quality and potential of the geothermal resource will not be funded under this FOA although it is allowable as recipient cost-share. Extensive subsurface data collection, analysis, and sharing is, however, a requirement. The collection of this data can be supported with DOE funding, such that the data is made publicly available through the Geothermal Data Repository so as to further the accrual of knowledge surrounding these unique systems.

Under this Topic Area, projects with existing permits or a clearly outlined and pre-positioned pathway to securing permitting will be given preference during the Merit Review Process. The Applicant or partners must provide sufficient legal documentation to demonstrate that they have the legal surface and subsurface rights necessary for geothermal resource extraction at the proposed site at the time of application or must provide clear documentation that surface and subsurface rights for geothermal resource extraction can be obtained within the timeframe of Phase 1 of the project. Letters of support from partners or subcontractors do not take the place of legal documentation of surface and subsurface rights.³⁰

³⁰ For projects on federal land, legal documentation may include a BLM lease, BLM site license, BLM exploration permit, BLM drilling permit, and a BLM utilization permit. For projects on private/state land, legal documentation may include: a deed or lease for the geothermal rights (as defined in that state), a similar document showing surface rights, and drilling & operating permits.

Unique Research Requirements for Topic Area 3:

Recipients that propose super-hot/supercritical operations will need to provide or collect targeted data sets with complimentary analysis to address technical unknowns associated with operations (all of which must be uploaded to the Geothermal Data Repository), including but not limited to:

- Analysis and modeling to predict the native state of the potential reservoir and the effect of drilling and stimulation perturbations.
- Fractures evolution as a result of perturbation (drilling and fluid injection).
- Collection of fluid/gas samples to refine current thermodynamic databases - (e.g., Reed & Palandri, 2021).
- Estimates of stress-strain relationships of the host rock under superhot/supercritical conditions.
- Geophysical datasets for detailed subsurface Lithologic, Rock Mechanical, and Structural Geologic characterization.

Please note that DOE will prioritize the collection of critical subsurface data, stimulation, and stimulation analysis in this Topic Area over additional well drilling, as our focus is to better understand how permeability, induced seismicity and geochemistry, evolve during stimulation and post-stimulation testing which ultimately impact the sustainability of super-hot/supercritical systems.

Drilling and Site Requirements:

At least one target well(s) must exist at proposed sites. For applications where an additional well is desired or where deepening of an existing well is required, only that portion of the award discussed in the **Drilling, Recompletion, and Workover Costs** subsection of the “Pilot Demonstration Requirements” section, can be applied to well construction activities. For sites that plan to operate using existing wells, DOE seeks wells that are in good condition and having high mechanical integrity that are capable of being put into operations relatively quickly and with minimal well interventions or workover, subject to the funding restrictions noted previously. Additionally, if a new well or wells are proposed, the applicant must describe in sufficient detail that the new well is not targeting a prime hydrothermal resource. Drilling Plans for Super-hot / Supercritical systems must include considerations and mitigations for challenging knowns and unknowns (e.g., high temperatures, dramatic pressure gradients, rapid phase transitions, variable reaction rates creating highly corrosive fluids, and the like) both in the context of health and safety perspective and materials and tool/equipment functionality. A

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risk-register detailing potential operational issues and specific mitigatory actions will be required as part of Stimulation and/or Re-completion/Drilling Plans in Phase 1.

If a new well(s) is proposed, **operators should note that drilling costs must be repaid to DOE if a commercial hydrothermal resource is identified and accessed during drilling.** For this FOA, a commercial hydrothermal resource is defined as a well that has a capacity of generating 3 MW or greater without any reservoir stimulation or enhancement, as confirmed by appropriate well testing.

Under this Topic Area, projects with existing permits or a clearly outlined and pre-positioned pathway to securing permitting will be given preference during the Merit Review Process. The Applicant or partners must provide sufficient legal documentation to demonstrate that they have the legal surface and subsurface rights necessary for geothermal resource extraction at the proposed site at the time of application or must provide clear documentation that surface and subsurface rights for geothermal resource extraction can be obtained within the timeframe of Phase 1 of the project. Letters of support from partners or subcontractors do not take the place of legal documentation of surface and subsurface rights.³¹

Although power production is not a requirement, it is an encouraged outcome, albeit beyond the scope/funding available through this FOA. Applicants must include a preliminary but thorough analysis of electrical power potential, prior to, and following the planned permeability enhancement activities as part of their Application's Technical Volume.

Topic Area 4: Eastern-U.S. EGS Stimulation (OPEN)

EGS demonstration located at a well-characterized Eastern U.S. site with near-term electrical and/or thermal power potential production.

Objectives: This Topic Area will target low permeability, high temperature geothermal anomalies in the Eastern U.S. with the *potential* for generation of electrical and/or thermal power production. **These demonstrations will focus on technical, organizational, and market learning.** Eastern U.S. Pilot demos will be required to utilize innovative stimulation or completion techniques and technologies to continue to hone our understanding of what is required, especially with respect to stimulation technology/methodologies, to demonstrate the viability of EGS in the terrains of the Eastern U.S.

³¹ For projects on federal land, legal documentation may include a BLM lease, BLM site license, BLM exploration permit, BLM drilling permit, and a BLM utilization permit. For projects on private/state land, legal documentation may include: a deed or lease for the geothermal rights (as defined in that state), a similar document showing surface rights, and drilling & operating permits.

Technical Requirements: Proposed sites/reservoirs should, per 42 U.S.C. 17194(d)), include sites where “subsurface characterization or geothermal energy integration analysis has been conducted” and in “locations that are potentially commercially viable for enhanced geothermal systems development, while also considering environmental impacts to the maximum extent practicable.”

Although electrical power production is not a requirement, it is both allowable and encouraged. Those projects lacking the infrastructure to produce electrical power will be required to present detailed analysis of potential electrical power of the proposed EGS resource.

Awards made under this announcement will be cooperative agreements that will include well stimulation, data collection, **thermal power (electrical power** if feasible), modeling, and analysis over four Phases.

Drilling and Site Requirements:

It is a requirement that at least one target well exist at any proposed Eastern U.S. Pilot Demonstration site prior to an award being made by DOE under this announcement. For applications where additional wells are proposed, only that portion of the award discussed above can be applied to well construction activities. For the existing well(s), DOE seeks wells that are in good condition and having high mechanical integrity that are capable of being put into operations relatively quickly and with minimal intervention or workover, subject to the funding restrictions noted previously. Applicants are encouraged to apply to drill additional wells on site only if sufficient site-specific geologic characterization and analysis has taken place to appropriately site the proposed well and to provide site information as specified in 42 U.S.C. 17194(d) (the level of data available will be reviewed as part of the Merit Review Process). Specific requirements for new drilling are included in the Project Phase Descriptions.

If a new well(s) is proposed, operators should note that drilling costs must be repaid to DOE if a commercial hydrothermal resource is identified and accessed during drilling. For this FOA, a commercial hydrothermal resource is defined as a well that has a capacity of generating 3 MW or greater without any reservoir stimulation or enhancement, as confirmed by appropriate well testing.

Under this Topic Area, projects with existing drilling permits or a clearly outlined and pre-positioned pathway to securing permits will be given preference during the Merit Review Process. The Applicant or partners must provide sufficient legal documentation to demonstrate that they have the legal surface and subsurface rights necessary for geothermal resource extraction at the proposed site at the time of application or must provide clear documentation that surface and subsurface rights for geothermal resource extraction can be obtained within

the timeframe of Phase 1 of the project. Letters of support from partners or subcontractors do not take the place of legal documentation of surface and subsurface rights.³²

Although power production is not a requirement, it is an encouraged outcome, albeit beyond the scope/funding available through this FOA. Applicants **must include a preliminary but thorough analysis of electrical and/or thermal power potential, prior to, and following the planned permeability enhancement activities** as part of their Application's Technical Volume.

Project Phase Descriptions:

Proposed projects should be completed in distinct phases with go/no-go decision points after Phase 1, 2, 3, and during Phase 4, as appropriate. Phases are described below with required objectives. It is not necessary to complete these objectives in the order listed; some objectives also may be completed in parallel depending on the proposed site.

All tasks should include SMART (Specific, Measurable, Achievable, Relevant, and Timely) milestones that demonstrate achievement included at the end of each objective.

Phase 1 – Planning + Permitting

The goal of Phase 1 is to complete mission-critical technical and logistical tasks that demonstrate site viability.

- Assess all available site characterization data and develop a conceptual geologic model if one does not already exist:
 - Compile site data into a conceptual geologic model of the proposed site (if one does not already exist). The model should include graphical representations of key characteristics that reflect site suitability for meeting GTO project goals and objectives. While reservoir modeling is not required during Phase 1, quantitative and/or other probabilistic analyses should be undertaken to bound uncertainties in the distribution and magnitude of key subsurface parameters including the extent of target reservoir rock units, temperature profile, fluid content, permeability and porosity, geologic structure and lithology and rock mechanical properties, petrology, and stress regime especially those which substantiate proposed stimulation methodologies;
 - Archive site data used to support the conceptual geologic model to GTO's Geothermal Data Repository (GDR), which hosts all data collected or developed by GTO-funded awards;

³² For projects on federal land, legal documentation may include a BLM lease, BLM site license, BLM exploration permit, BLM drilling permit, and a BLM utilization permit. For projects on private/state land, legal documentation may include: a deed or lease for the mineral/water/geothermal rights (as defined in that state), a similar document showing surface rights, and drilling & operating permits.

- **For Topic Area 3 Only:**
 - Teams working in super-hot/supercritical environments should outline a plan to collect data prior to or during well re-completion or new well construction (if applicable) and stimulation to inform their required analysis on the following non-inclusive list of subjects:
 - Analysis and modeling to predict the native state of the potential reservoir and the effect of drilling and stimulation perturbations.
 - Fracture evolution as a result of perturbation (drilling and fluid injection).
 - Collection of fluid/gas samples to refine current thermodynamic and reservoir fluid databases (e.g., Reed & Palandri, 2021).
 - Development of stress/strain constitutive relationships of the host rock in super-hot/supercritical conditions.
 - Geophysical data sets for detailed subsurface reservoir Lithologic, Rock Mechanical, and Structural Geologic characterization.
- **Thermal Power Production Feasibility (if applicable):**
 - For projects that propose thermal power production, provide an analysis of project economics including a description of the resource and availability, market approach (e.g., infrastructure, technologies, partnerships), and spatial proximity of thermal power off-takers.
- **Develop Stimulation Plan:**
 - The Stimulation Plan must describe in detail the proposed stimulation method and must reference an existing, comprehensive geologic model that describes the geology of the site, outlines the presence of any mapped or possible faults, current or historical seismicity (if any), as well as subsurface principal stress orientations and magnitudes. If critical data gaps exist, DOE will consider the acquisition of new well characterization data in order to develop a rigorous and thorough stimulation plan, if it is clearly outlined in the application materials and budget documents, but DOE's expectation is that existing datasets will be utilized to develop the Stimulation Plan. All relevant geological, geomechanical, petrophysical, geochemical, geophysical and seismological data may be considered in the development of the Stimulation Plan.
 - The Stimulation Plan must also include the implementation of novel reservoir stimulation technologies and methodologies employing multi-zone stimulation approaches (**Please note that multi-zone stimulation is not required for Topic Area 3**). Stimulation or isolation tools and technologies of interest for deployment at the Pilot Demo site must be described in the Stimulation Plan in detail. If the tools are currently under development, they **must be at a TRL of 6** to be considered for testing at the Pilot Demo site. Evidence of this TRL level must be provided in the stimulation plan.

- Re-stimulation and stimulation in adjacent existing wells (to be connected during stimulation) will be permitted and consideration of the staging of subsequent re-stimulation or additional well stimulation should be included in the Stimulation Plan and included in all **electrical and/or thermal power** production capacity modeling and Induced Seismicity Mitigation Plan analysis and mitigations.
- **Initiate Permitting Activities:**
 - Develop an updated schedule and detailed budget for the completion of the relevant federal, state, and local permitting.
 - The recipient will be required to present updated permitting requirements and schedule to DOE and all applicable federal and state permitting agencies in a Phase 1 Permitting meeting.
 - Initiate permitting activities with all relevant federal, state, and local permitting agencies.
 - Environmental reviews, permits, and approvals, must be recorded and/or obtained in accordance with NEPA and other state and local requirements and should include all relevant activities to the proposed project (characterization, monitoring, drilling, technology testing, stimulation, post-stimulation testing) in the context of potential environmental impacts.
 - For projects proposing drilling, all drilling permits and regulatory approvals must be issued by appropriate permitting authorities and relevant regulatory agencies prior to the end of Phase 1.
- **Establish Wellbore Readiness:**
 - **For Existing Wells:**
 - The requirement for Phase 1 is final planning for the workover or re-completion of the candidate well. This can include re-entering the proposed wellbore to determine if proposed re-completion plans are feasible and adequate and to develop more accurate budgets for re-completion activities to take place in Phase 2. Please note that DOE seeks wells that are in operational condition and/or require minimal intervention to allow stimulation.
 - For wells requiring workover, re-completion, or additional drilling, detailed operational plans and costs must be submitted to DOE during Phase 1.
 - **For New Wells**
 - The requirement for Phase 1 is to build on preliminary drilling plans supplied in the application materials to develop a final drilling plan that fully accounts for the subsurface stress conditions at the site, positions the team to access fractures effectively and in accordance with their stimulation plan, and provides detailed mitigatory actions and considerations for common geothermal drilling challenges including high

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temperatures, high fluid pressures, corrosive gases, lost circulation, and other such operational hazards (Finger and Blankenship, 2010)³³. GTO can provide support to teams in accounting for geothermal considerations. Drilling programs will be reviewed by independent drilling experts in collaboration with the DOE Team and must be approved by the DOE Team prior to commencement of drilling operations.

- During Phase 1, Teams will be permitted to release bids for subcontractors related to drilling and on-site operational support and procure long lead time items required for drilling.
 - Teams are required to supply DOE with complete and detailed plans and cost estimates for new well development.
 - Teams will be required to convene a panel of external experts, which can include the external DOE experts mentioned above, to review and support the development of the well plan. Following plan development, the team will conduct a formal “Drill the Well On Paper” (DWOP) exercise with representatives from DOE present. Upon completion of the DWOP exercise, a final drilling plan will be submitted to DOE for approval. DOE approval is required prior to commencement of drilling operations.
- Begin Induced Seismicity Mitigation Plan (ISMP) Preparations:
 - Initiate preliminary seismic monitoring: Deployment of a telemetered seismic monitoring array comprised surface and/or borehole (preferred) stations capable of recording seismic events with magnitudes as small as magnitude 0.0 and preferably magnitude lower and a minimum of 30 days of recorded seismic data.
 - Recipients will be required to develop an ISMP in line with the current version of the “Best Practices for Addressing Induced Seismicity Associated With Enhanced Geothermal Systems (EGS).”
(https://wellbore.lbl.gov/downloads/Best_Practices_EGS_Induced_Seismicity_8-APR-2016.pdf)
 - Develop Environmental, Safety and Health Plan:
 - An Environmental, Safety and Health (ES&H) Plan must identify and analyze safety risks for existing and potential hazards or unsafe conditions associated with field activities. The ES&H Plan must identify contact personnel responsible for on-site safety as well as provide for procedures and protocols for hazards communication, emergency evacuation and response, and any ES&H training requirements. ES&H requirements shall flow down to subcontractors.
 - Communications Outreach
 - Recipients should conduct communications and outreach activities with stakeholders, including labor unions and the general public to listen to concerns, provide details on their project plans, and share their project successes.

³³ <https://www1.eere.energy.gov/geothermal/pdfs/drillinghandbook.pdf>

- During Phase 1, it is expected that a full or part time “Information Officer” will be hired to direct all engagement with the local community, ensuring there is a direct conduit between the stakeholders and the project team.
- The Information Officer should coordinate active engagement with local stakeholders starting in Phase 1, prior to any drilling or stimulation activities.
- Phase 1 Reporting:
 - The minimum technical requirement for Phase 1 is to obtain sufficient information and permission to proceed to Phase 2 to stimulate the proposed wellbore. This information should be documented in a Phase 1 report.
 - Overview of geological conditions via a summary of the existing geological model, including a description of mapped or unmapped / predicted faults. Interpretation and representation of the natural fracture system and basic prediction of the direction(s) of fracture growth.
 - A detailed well stimulation plan that includes required tasks with go/no-go decisions, a budget, and a schedule and includes estimated volumes of rock to be stimulated and power/heat potential expected to be generated.
 - Detailed plans and costs for projects that require drilling, re-completion, or workover.
 - Updated Environmental Information Volume (EIV): All reports, plans, permits, licenses, and other items required by governmental regulatory agencies for the performance of this work, including NEPA determination and documentation.
- **GO/No-Go –All requirements of Phase 1 must be completed with no intractable technical or operational challenges identified or encountered and unmitigated during Phase 1.**

Phase 2 - FOR PROJECTS UTILIZING EXISTING WELLS – Final Site Preparations

- Initiate Work-over or Re-Completion Activities:
 - Teams that propose the use of existing wells will implement workover or re-completion plans in Phase 2.
 - Teams will be required to implement all ES&H activities outlined in their ES&H and Re-Completion Programs and check in with DOE and relevant DOE contracted support teams throughout the drilling program.
 - Teams working in Super-hot/supercritical environments will be required to develop specific mitigation strategies in their ES&H Plan associated with anticipated environments.
 - During workover or re-completion operations, the collection of new logs, approved by DOE, including borehole imaging logs (if open hole exists) for pre- and post-stimulation comparison are encouraged. DOE may establish standard data collection requirements (funded by DOE) for all funded drilling activities to support drilling research in other parts of the GTO programs.

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- Teams working in Super-hot/supercritical environments should implement well characterization activities before or during re-completion, as outlined in Phase 1 Plans.
- Following workover or re-completion activities, the well testing must be performed in an appropriate manner agreed upon by DOE to establish the baseline performance of the well and verify that they are not commercially viable and require stimulation to be viable.
- **Revise Geologic Model:**
 - Refine Phase 1 conceptual geologic site model to incorporate new characterization or monitoring data informed by any new non-invasive site characterization as permitted by NEPA status.
- **Revise Stimulation Plan:**
 - Stimulation Plans should be revised based on data and analysis collected during workover or re-completion operations (if relevant). Teams are permitted to conduct dynamic reservoir modeling based on the refined geologic site model to inform stimulation design.
- **Finalize Induced Seismicity Mitigation Plan:**
 - Finalize the Induced Seismicity Mitigation Plan, which incorporates Micro Earthquake (MEQ) data and associated analysis into a completed Probabilistic Seismic Hazard Analysis (PSHA), Criteria for Damage and Vibration, and Mitigation Actions for field testing.
- **Finalize Required Permitting Activities:**
 - In preparation for stimulation and by the end of Phase 2, all NEPA, State, and Local permits required for stimulation operations must be finalized.
- **GO/No-Go - All requirements of Phase 2 must be met, and any intractable technical or operational challenges encountered during drilling or field work must be adequately mitigated.**

Phase 2 - FOR PROJECTS DRILLING NEW WELLS – Drilling and Site Preparations

- **Initiate Drilling Activities:**
 - Teams approved to drill a new well will be required to implement all ES&H activities outlined in their ES&H and Drilling Programs and check in with DOE and relevant DOE contracted support teams throughout the drilling program.
 - Teams will be required to work with DOE and a Technical Monitoring Team to assist in providing operational support and feedback during drilling. Drilling costs will be monitored in coordination with DOE project management team to ensure projects stay within allowable cost ranges proposed in the original cost estimate.
 - Logging activities, as described in the drilling plan and approved by DOE are encouraged during drilling operations to further refine geologic models and stimulation procedures and improve geothermal drilling

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- efficiency. DOE will fund these activities with the expectation that all data will be submitted to the GDR quarterly.
- All relevant drilling parameters will be monitored and logged using an electronic data recording (EDR) system, all events of note will be documented as metadata in the submitted EDR files.
 - Detailed drilling reports and cost tracking reports will be provided to DOE via email to the project officer on a daily basis both in PDF format and in the native format of the software used to generate the daily reports.
 - Newly drilled wells under Topic Area 1,2 and 4 must be subjected to appropriate testing to establish the baseline performance of the well and verify that they are not commercially viable and require stimulation to be viable.
 - The skill standards and certifications of workers engaged in the drilling and related activities.
- **Revise Geologic Model:**
 - Refine Phase 1 conceptual geologic site model to incorporate new characterization or monitoring data informed by any new non-invasive site characterization as permitted by NEPA status.
 - **Revise Stimulation Plan:**
 - Post drilling, Stimulation Plans should be revised based on data and analysis collected during drilling operations. Teams are permitted to conduct dynamic reservoir modeling based on the refined geologic site model to inform stimulation design.
 - **Finalize Induced Seismicity Mitigation Plan:**
 - Finalize the Induced Seismicity Mitigation Plan, which incorporates MEQ data and associated analysis into a completed Probabilistic Seismic Hazard Analysis (PSHA), Criteria for Damage and Vibration, and Mitigation Actions for field testing.
 - **Finalize Required Permitting Activities:**
 - In preparation for stimulation and by the end of Phase 2, all Federal, State, and Local permits required for stimulation operations must be finalized.
 - **GO/No-Go – All requirements of Phase 2 must be met, and any intractable technical or operational challenges encountered during drilling or field work must be adequately mitigated.**

Phase 3 – Stimulation + Testing

The goal of Phase 3 is to complete well stimulation(s) and establish flow **between injection and production streams** of geothermal fluids, thoroughly analyze stimulation results, and collect and archive stimulation data for public use.

Please Note: Recipients are expected to conduct and promote communications, education, and outreach activities with DOE, outside stakeholders, and the public to promote awareness of this initiative throughout Phase 3.

- **Phase 3A: Perform Stimulation Activities**
 - Complete stimulation of the candidate geothermal well via hydraulic stimulation (or other means) and to establish inter-well connectivity based on stimulation plans outlined in Phase 1 and Phase 2.
 - All relevant stimulation treatment parameters will be electronically recorded and submitted to the GDR. Metadata of all notable events shall be included in the electronic files.

- **Phase 3B: Testing and Analysis**
 - Following stimulation activities, well testing must be performed in an appropriate manner to establish a direct comparison of current production performance to pre-stimulation well production performance. DOE approval of well testing plan and procedures is required prior to commencement of well testing operations.

- **Phase 3C: Additional Stimulation Activities**
 - If additional stimulation in original target well is anticipated to improve on the results of the initial stimulation efforts, the applicant may propose a repeat of the previous stimulation with appropriate modifications to address learnings from the first effort.
 - Alternative stimulation methods in the original target well or stimulation activities in a well or wells other than the original target well may be proposed to address learnings from the first effort.

- **Reporting and Publications:**
 - At a minimum, the Phase 3 report should include the following data sets which must be uploaded to the Geothermal Data Repository (GDR):
 - Any drilling or recompletion reports;
 - Daily stimulation reports;
 - Stimulation data;
 - Well logs, as needed;
 - Formation response data following stimulation;
 - Pumping and related data to evaluate the stimulation; and
 - Seismic data prior to and after stimulation.

- **GO/No-Go – All requirements of Phase 3 must be met, and any intractable technical or operational challenges encountered during stimulation, seismic monitoring, or other field work must be adequately mitigated.**

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Phase 4 – EGS Reservoir Sustainability (Desired but not required for Topic Area 3)

The goal of Phase 4 is to assess and validate long-term fluid flow and heat extraction rates following well stimulation. Phase 4 must include monitoring and characterization of the targeted formation to stimulation to understand and assess the sustainability of the EGS reservoir.

- **Perform Long-Term Flow Testing:**
 - Flow testing will be required for 4-6 months, commencing early in Phase 4.
- **Update Power/Heat Production Estimates:**
 - An update to the capacity analysis (potential in MWth and/or MWe) of the proposed EGS resource should be provided to DOE and supported and refined based on flow test data.
- **GO/No-Go – Initial long-term flow tests are indicative of sufficient electrical and/or thermal power generation potential, such that the well(s) in question is commercially viable and should advance to the electrical and/or thermal power production stage. Any intractable challenges encountered during flow testing must be adequately mitigated. Any intractable operational challenges (e.g., costs) that exist which would limit electrical and/or thermal power energy production potential have been clearly identified and mitigated.**
- **Power Production (Required for Topic Area 1, Optional for Topic Areas 2, 3 and 4):**
 - All operational tasks required to facilitate power production should take place in Phase 4, including connecting or modifying pipelines. Awardees will be expected to cost share power production tasks.
- **Post Stimulation Data Collection**
 - Non-proprietary data collected during all phases of the projects will be made available to the public through the Geothermal Data Repository.
 - Data collection to take place in the months following stimulation can include the following (Only microseismic monitoring is required):
 - Microseismic data and interpretation;
 - Productivity or injectivity data and analysis;
 - Logs run in the well (PTS, sonic, natural gamma, tool-head temperature, etc.);
 - Borehole imaging logs (e.g., televiwer, FMS, other) for both pre- and post-stimulation;
 - Well flow rates and wellhead temperatures;
 - Chemistry of produced fluid and mineral dissolution/precipitation;
 - Formation response/evolution data; and

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- Tracer data, analysis, and results of tracer tests if the well is in communication with other wells in the field or to determine such connection.
- **Reporting and Publications:**
 - Short- and long-term flow test reports, updated **electrical and/or thermal power** production analysis and/or production data should be included in a final technical report that contains all Phases of the award.
 - For wells drilled under this FOA, a separate retrospective well report including lessons learned.
 - All cost data, digitally recorded data, and daily reports for new wells and as applicable electronically recorded data submitted to the GDR.

Go/No-Go Decision Points

There must be go/no-go decision points after Phase 1, after Phase 2, and after Phase 3. Additional milestones and/or status reviews may be added to the project during negotiations. At go/no-go decision points, DOE will make one of three decisions for each award based on the technical progress made relative to the Statement of Project Objectives, actual spending during the project period, adherence to the proposed project schedule, and continued financial viability of the project team:

- “Go” Forward – the project is on track, minimal or no modifications are required, work is acceptable, the proposed work plan for the next performance phase is acceptable, funding is available, and the project continues to be appropriate to the mission and goals of GTO.
- “Hold” – the project is still viewed as having a high likelihood of success; however, additional information is required before a “Go” or “No-Go” decision can be made.
- “No-Go” – the project will either be put on hold or DOE may not provide further funding. This may be due to irresolvable technical difficulties, changes in the GTO mission, goals or portfolio or lack of appropriated funds. Should the project be terminated, the final annual report will be accepted by GTO to fulfill the final technical report requirement.

All work for projects selected under this FOA must be performed in the United States. See Section IV.J.iii. and Appendix C.

C. Applications Specifically Not of Interest

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (See Section III.D. of the FOA):

- Applications that fall outside the technical parameters specified in Sections I.A. and I.B. of the FOA.
- Applications that propose to conduct demonstration activities outside of the United States of America.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- Applications that do not intend to establish feasibility for power production.
- Applications which propose a cost share percentage less than 20%.
- Applications that utilize a control number which was created prior to **Feb 13, 2024**.

D. Authorizing Statutes

The programmatic authorizing statute is:

Section 615 of the Energy Independence and Security Act of 2007 (as amended by Section 3002 of the Energy Act of 2020 (codified at 42 U.S.C. § 17194(d)) and Section 41007 of the Infrastructure Investment and Jobs Act of 2021 (Pub. L. 117-58)

Awards made under this announcement will fall under the purview of 2 CFR Part 200 as amended by 2 CFR Part 910.

E. Notice of Bipartisan Infrastructure Law–Specific Requirements

Be advised that special terms and conditions apply to projects funded by the BIL relating to:

- Reporting, tracking, and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the internet;
- Access to records by Inspectors General and the Government Accountability Office;
- Requiring all of the iron, steel, manufactured goods, and construction materials used in the infrastructure activities of applicable projects are produced in the United States;
- Ensuring laborers and mechanics employed by contractors or subcontractors on BIL-funded projects are paid wages equivalent to prevailing wages on similar projects in the area;

- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general; and
- Certification and registration.

Recipients of funding appropriated by the BIL must comply with requirements of all applicable federal, state, and local laws, regulations, DOE policy and guidance, and instructions in this FOA. Recipients must flow down the requirements to subrecipients to ensure the recipient's compliance with the requirements.

F. R&D Community Benefits Plan

DOE is committed to investing in research and development (R&D) of innovations that deliver benefits to the American public and lead to commercialization of technologies and products that foster sustainable, resilient, and equitable access to clean energy. Further, DOE is committed to supporting the development of more diverse, equitable, inclusive, and accessible workplaces to help maintain the nation's leadership in science and technology.

To support the goal of building a clean and equitable energy economy, projects funded under this BIL FOA are expected to (1) advance diversity, equity, inclusion, and accessibility (DEIA); (2) contribute to energy equity (the Justice40 Initiative and other considerations); and (3) invest in quality jobs. To ensure these objectives are met, applications must include a Research and Development Community Benefits Plan (R&D Community Benefits Plan)³⁴ that addresses the three objectives stated above. See Section IV.D.xvi. for the more information on the R&D Community Benefits Plan content requirements.

³⁴ Most DOE BIL FOAs focused on demonstration and deployment (D&D) also require a Community Benefits Plan; however, the plan content requirements for R&D-focused FOAs vary from the D&D Community Benefits Plan content requirements.

II. Award Information

A. Award Overview

i. Estimated Funding

DOE expects to make a total of approximately \$74 Million of federal funding available for new awards **under all rounds** of this FOA, subject to the availability of appropriated funds. DOE anticipates making approximately 4-7 awards **in total** under **all rounds** of this FOA. DOE may issue one, multiple, or no awards. Individual awards may vary between \$5 Million and \$25 Million.

DOE may issue awards in one, multiple, or none of the following topic areas:

Topic Area Number	Topic Area Title	Anticipated Number of Awards	Anticipated Minimum Award Size for Any One Individual Award (Fed Share)	Anticipated Maximum Award Size for Any One Individual Award (Fed Share)	Approximate Total Federal Funding Available for All Awards	Anticipated Period of Performance (months)
Topic Area 1	EGS Proximal Pilot Demonstration	CLOSED				
Topic Area 2	EGS Green Field Pilot Demonstrations	CLOSED				
Topic Area 3	Super-hot / Supercritical EGS Pilot Demonstrations	CLOSED				
Topic Area 4	Eastern-US EGS Pilot Demonstration	1	\$5 M	\$14.2 M	\$14.2 M	36 - 60

DOE may establish more than one budget period for each award and fund only the initial budget period(s). Funding for all budget periods, including the initial budget period, is not guaranteed.

ii. Period of Performance

DOE anticipates making awards that will run from 36 up to 60, comprised of one or more budget periods. Project continuation will be contingent upon several elements, including satisfactory performance and DOE's Go/No-Go decision. For a complete list and more information on the Go/No-Go review, see Section VI.B.xv.

iii. New Applications Only

DOE will accept only new applications under this FOA. DOE will not consider applications for renewals of existing DOE-funded awards through this FOA.

B. DOE Funding Agreements

Through cooperative agreements and other similar agreements, DOE provides financial and other support to projects that have the potential to realize the FOA objectives. DOE does not use such agreements to acquire property or services for the direct benefit or use of the U.S. government.

i. Cooperative Agreements

DOE generally uses cooperative agreements to provide financial and other support to prime recipients.

Through cooperative agreements, DOE provides financial or other support to accomplish a public purpose of support or stimulation authorized by federal statute. Under cooperative agreements, the government and prime recipients share responsibility for the direction of projects.

DOE has substantial involvement in all projects funded via cooperative agreement. See Section VI.B.x. of the FOA for more information on what substantial involvement may involve.

ii. Funding Agreements with Federally Funded Research and Development Center (FFRDCs)³⁵

In most cases, FFRDCs are funded independently of the remainder of the project team. The FFRDC then executes an agreement with any non-FFRDC project team members to arrange work structure, project execution, and any other matters. Regardless of these arrangements, the entity that applied as the prime recipient for the project will remain the prime recipient for the project. See Section III.E.iii.

iii. Other Transactions Authority Agreements

If determined necessary to better achieve the program mission, DOE will consider issuing an award using its Other Transactions Authority (OTA). OTA agreements may not be subject to the requirements of 2 CFR Part 200 as amended by 2 CFR Part 910.

³⁵ FFRDCs are public-private partnerships that conduct research for the U.S. government. A listing of FFRDCs can be found at <http://www.nsf.gov/statistics/ffrdclist/>.

In an OTA agreement, 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 modify existing intellectual property rights or 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.

An applicant may request an OTA agreement if it believes using an OTA, such as a Technology Investment Agreement, could benefit the research, development, and demonstration (RD&D) objectives of the program and can document these benefits. If an applicant is seeking to negotiate an OTA, the applicant must include an explicit request in its Full Application. After an applicant is selected for award negotiation, the Contracting Officer will determine if awarding an OTA would benefit the RD&D objectives of the program in ways that likely would not happen if another type of assistance agreement is used (e.g., cooperative agreement subject to the requirements of 2 CFR Part 200 as amended by 2 CFR Part 910).

III. Eligibility Information

To be considered for substantive evaluation, an applicant's submission must meet the criteria set forth below. If the application does not meet these eligibility requirements, it will be considered ineligible and removed from further evaluation.

A. Eligible Applicants

i. Domestic Entities

The proposed prime recipient and subrecipient(s) must be domestic entities. The following types of domestic entities are eligible to participate as a prime recipient or subrecipient of this FOA:

1. Institutions of higher education;
2. For-profit entities;
3. Nonprofit entities; and
4. State and local governmental entities and Indian tribes.

To qualify as a domestic entity, the entity must be organized, chartered, or incorporated (or otherwise formed) under the laws of a particular state or territory of the United States; have majority domestic ownership and control; and have a physical place of business in the United States.

DOE/NNSA FFRDCs are eligible to apply for funding as a prime recipient or subrecipient.

Non-DOE/NNSA FFRDCs are eligible to participate as a subrecipient but are not eligible to apply as a prime recipient.

Federal agencies and instrumentalities (other than DOE) are eligible to participate as a subrecipient but are not eligible to apply as a prime recipient.

Entities banned from doing business with the U.S. government, such as entities debarred, suspended, or otherwise excluded from or ineligible for participating in federal programs, are not eligible.

Nonprofit organizations described in Section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are **not** eligible to apply for funding.

ii. **Foreign Entities**

In limited circumstances, DOE may approve a waiver to allow a foreign entity to participate as a prime recipient or subrecipient. A foreign entity may submit a Full Application to this FOA, but the Full Application must be accompanied by an explicit written waiver request. Likewise, if the applicant seeks to include a foreign entity as a subrecipient, the applicant must submit a separate explicit written waiver request in the Full Application for each proposed foreign subrecipient.

Appendix C lists the information that must be included in a foreign entity waiver request. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

B. **Cost Sharing**

Applicants are bound by the cost share proposed in their Full Applications if selected for award negotiations.

The cost share must be at least 20% of the total project costs³⁶ for research and development projects.³⁷ The cost share must come from non-federal sources unless otherwise allowed by law.

Any cost incurred prior to the award selection date (such as well drilling or workovers, collection of rock/core cuttings, well-field development, or power plant construction) are not eligible for consideration as recipient cost share. However, recipient cost share for wells drilled only after December 31, 2008 and prior to the project period start date may be allowable if those costs fall into depreciation covered under an indirect rate agreement or allocation method approved by a governmental agency. Please note that target wells that have been drilled prior to December 31, 2008, are still eligible for stimulation, but will not be allowable for consideration as cost share.

To help applicants calculate proper cost share amounts, DOE has included a cost share information sheet and sample cost share calculation as Appendices A and B to this FOA.

i. Legal Responsibility

Although the cost share requirement applies to the project as a whole, including work performed by members of the project team other than the prime recipient, the prime recipient is legally responsible for paying the entire cost share. If the funding agreement is terminated prior to the end of the project period, the prime recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The prime recipient is solely responsible for managing cost share contributions by the project team and enforcing cost share obligation assumed by project team members in subawards or related agreements.

ii. Cost Share Allocation

Each project team is free to determine how best to allocate the cost share requirement among the team members. The amount contributed by individual project team members may vary, as long as the cost share requirement for the entire project is met.

³⁶ Total project costs are the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.

³⁷ Energy Policy Act of 2005, Pub.L. 109-58, sec. 988. Also see 2 CFR 200.306 and 2 CFR 910.130 for additional cost sharing requirements.

iii. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable federal cost principles, as described in Section IV.J.i. of the FOA. In addition, cost share must be verifiable upon submission of the Full Application. Cost share may be provided in the form of cash or cash equivalents, or in-kind contributions. Cost share must come from non-federal sources (unless otherwise allowed by law), such as project participants, state or local governments, or other third-party financing. DOE Loan Guarantee, cannot be leveraged by applicants to provide the required cost share or otherwise support the same scope that is proposed under a project.

Cost share may be provided by the prime recipient, subrecipients, or third parties (entities that do not have a role in performing the scope of work). Vendors/contractors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

Cash contributions include but are not limited to personnel costs, fringe costs, supply and equipment costs, indirect costs, and other direct costs.

In-kind contributions are those where a value of the contribution can be readily determined, verified, and justified but where no actual cash is transacted in securing the good or service comprising the contribution. Allowable in-kind contributions include but are not limited to the donation of volunteer time or the donation of space or use of equipment.

Project teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the federal government did not provide the funding to the state or local government.

The recipient may not use any of the following sources to meet cost share obligations:

- Revenues or royalties from the prospective operation of an activity beyond the project period;
- Proceeds from the prospective sale of an asset of an activity;
- Federal funding or property (e.g., federal grants, equipment owned by the federal government); or
- Expenditures that were reimbursed under a separate federal program.

Project teams may not use the same cash or in-kind contributions to meet cost share requirements for more than one project or program.

Cost share contributions must be specified in the project budget, verifiable from the prime recipient's records, and necessary and reasonable for proper and efficient accomplishment of the project. As all sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same federal regulations as federal dollars to the project. Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants are encouraged to refer to 2 CFR 200.306 and 2 CFR 910.130 for additional cost sharing requirements.

iv. Cost Share Contributions by FFRDCs

Because FFRDCs are funded by the federal government, costs incurred by FFRDCs generally may not be used to meet the cost share requirement. FFRDCs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or another non-federal source.

v. Cost Share Verification

Applicants are required to provide written assurance of their proposed cost share contributions in their Full Applications.

Upon selection for award negotiations, applicants are required to provide additional information and documentation regarding their cost share contributions. Please refer to Appendix A of the FOA.

vi. Cost Share Payment

DOE requires prime recipients to contribute the cost share amount incrementally over the life of the award. Specifically, the prime recipient's cost share for each billing period must always reflect the overall cost share ratio negotiated by the parties (i.e., the total amount of cost sharing on each invoice when considered cumulatively with previous invoices must reflect, at a minimum, the cost sharing percentage negotiated). As FFRDC funding will be provided directly to the FFRDC(s) by DOE, prime recipients will be required to provide project cost share at a percentage commensurate with the FFRDC costs, on a budget period basis, resulting in a higher interim invoicing cost share ratio than the total award ratio.

In limited circumstances, and where it is in the government's interest, the DOE Contracting Officer may approve a request by the prime recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly.

Regardless of the interval requested, the prime recipient must be up to date on cost share at each interval. Such requests must be sent to the Contracting Officer during award negotiations and include the following information: (1) a detailed justification for the request; (2) a proposed schedule of payments, including amounts and dates; (3) a written commitment to meet that schedule; and (4) such evidence as necessary to demonstrate that the prime recipient has complied with its cost share obligations to date. The Contracting Officer must approve all such requests before they go into effect.

C. Compliance Criteria

All applicant submissions must:

- Comply with the applicable content and form requirements listed in Section IV. of the FOA;
- Include all required documents;
- Be uploaded and submitted to EERE eXCHANGE <https://eere-eXCHANGE.energy.gov>; and
- Be submitted by the deadline stated in the FOA.

DOE will not review or consider submissions submitted through means other than EERE eXCHANGE, submissions submitted after the applicable deadline, or incomplete submissions.

Applicants are strongly encouraged to submit their Letters of Intent and Full Applications at least 48 hours in advance of the submission deadline. Under normal conditions (i.e., at least 48 hours before the submission deadline), applicants should allow at least one hour to submit a Letter of Intent or Full Application. Once the Letter of Intent or Full Application is submitted in EERE eXCHANGE, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit the Letter of Intent or Full Application before the applicable deadline. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

D. Responsiveness Criteria

All Applications Specifically Not of Interest, as described in Section I.C. of the FOA, are deemed nonresponsive and are not reviewed or considered.

E. Other Eligibility Requirements

i. Requirements for DOE/NNSA FFRDCs Listed as the Applicant

A DOE/NNSA FFRDC is eligible to apply for funding under this FOA if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application.

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 assigned programs at the Laboratory.

If a DOE/NNSA FFRDC is selected for award negotiation, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract.

ii. Requirements for DOE/NNSA and Non-DOE/NNSA FFRDCs Included as a Subrecipient

DOE/NNSA and non-DOE/NNSA FFRDCs may be proposed as a subrecipient on another entity's application subject to the following guidelines:

a. Authorization for non-DOE/NNSA FFRDCs

The federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with its authority under its award.

b. Authorization for DOE/NNSA FFRDCs

The cognizant Contracting Officer for the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this 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 assigned programs at the Laboratory.

c. Funding, Cost Share, and Subaward with FFRDCs

The value of and funding for the FFRDC portion of the work will not normally be included in the award. DOE/NNSA FFRDCs participating as a subrecipient on a project will be funded directly through the DOE field work proposal (WP) process. Non-DOE/NNSA FFRDCs participating as a subrecipient will be funded through an interagency agreement with the sponsoring agency.

Although the FFRDC portion of the work is excluded from the award, the applicant's cost share requirement will be based on the total cost of the project, including the applicant's, the subrecipient's, and the FFRDC's portions of the project.

Unless instructed otherwise by the DOE Contracting Officer for the DOE award, all FFRDCs are required to enter into a Cooperative Research and Development Agreement³⁸ (CRADA) or, if the role of the DOE/NNSA FFRDC is limited to technical assistance and intellectual property is not anticipated to be generated from the DOE/NNSA FFRDC's work, a Technical Assistance Agreement (TAA), with at least the prime recipient before any project work begins. Any questions regarding the use of a CRADA or TAA should be directed to the cognizant DOE field intellectual property (IP) counsel.

The CRADA or TAA is used to ensure accountability for project work and provide the appropriate management of IP, e.g., data protection and background IP. The CRADA or TAA must be agreed upon by all parties and submitted to DOE or other sponsoring agency, when applicable, for approval, or submitted to DOE for notice under the Master Scope of Work process, when applicable, using any DOE or other sponsoring agency approved CRADA or TAA template without substantive changes by the time the award is made to the prime recipient.

34 A cooperative research and development agreement is a contractual agreement between a national laboratory contractor and a private company or university to work together on research and development. For more information, see <https://www.energy.gov/gc/downloads/doe-cooperative-research-and-development-agreements>³⁹ Tribal land is as defined in 25 U.S.C. §§ 3501(2), (3), (4)(A) and (13)

- d. Responsibility
The prime recipient 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 prime recipient and the FFRDC.

F. Limitation on Number of Full Applications Eligible for Review

An entity may submit more than one Full Application to this FOA, provided that each application describes a unique, scientifically distinct project.

G. Questions Regarding Eligibility

DOE will not make eligibility determinations for potential applicants prior to the date on which applications to this FOA must be submitted. The decision whether to apply in response to this FOA lies solely with the applicant.

IV. Application and Submission Information

A. Application Process

The application process includes two phases: Letter of Intent and Full Application. **Only applicants who have submitted a Letter of Intent prior to the deadline shown in the table on the first page will be eligible to submit a Full Application.**

At each phase, DOE performs an initial eligibility review of the applicant submissions to determine whether they meet the eligibility requirements of Section III of the FOA. DOE will not review or consider submissions that do not meet the eligibility requirements of Section III. All submissions must conform to the following form and content requirements, including maximum page lengths (described below) and must be submitted via EERE Exchange at <https://eere-Exchange.energy.gov>, unless specifically stated otherwise. **DOE will not review or consider submissions submitted through means other than EERE Exchange, submissions submitted after the applicable deadline, or incomplete submissions.** DOE will not extend deadlines for applicants who fail to submit required information and documents due to server/connection congestion.

All submissions must conform to the form and content requirements described below, including maximum page lengths.

- Each must be submitted in Adobe PDF format unless stated otherwise;
- Each must be written in English;
- All pages must be formatted to fit on 8.5" x 11" paper with margins not less than one inch on every side. Use Calibri typeface, a black font color, and a font size of 12-point or larger (except in figures or tables, which may be 10-point font). A symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement;
- A **control number** will be issued when an applicant begins the EERE eXCHANGE application process. The control number must be included with all application documents. Specifically, the control number must be prominently displayed on the upper right corner of the header of every page and included in the file name (i.e., *Control Number_Applicant Name_Full Application*);
- Page numbers must be included in the footer of every page; and
- Each submission must not exceed the specified maximum page limit, including cover page, charts, graphs, maps, and photographs when printed using the formatting requirements set forth above and single spaced. If applicants exceed the maximum page lengths indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

DOE urges applicants to carefully review their Letters of Intent and Full Applications to allow sufficient time for the submission or required information and documents. Full Applications that pass the initial eligibility review will undergo comprehensive technical merit review according to the criteria identified in Section V of the FOA.

i. Additional Information on EERE eXCHANGE

EERE eXCHANGE is designed to enforce the deadlines specified in this FOA. The "Apply" and "Submit" buttons will automatically disable at the defined submission deadlines.

Applicants who experience technical difficulties with submission PRIOR to the FOA deadline should contact the EERE eXCHANGE helpdesk for assistance (EERE-eXCHANGESupport@hq.doe.gov).

B. Application Forms

To access application forms and instructions available on EERE eXCHANGE, go to <https://eere-eXCHANGE.energy.gov> and select the appropriate funding opportunity number.

Note: The maximum file size that can be uploaded to the EERE eXCHANGE website is 50MB. Files larger than 50MB cannot be uploaded and hence cannot be submitted for review. If a file is larger than 50MB but is still within the maximum page limit specified in the FOA, it must be broken into parts and denoted to that effect. For example:

TechnicalVolume_Part_1

TechnicalVolume_Part_2

DOE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 50MB.

C. Content and Form of the Letter of Intent

Applicants must submit a Letter of Intent by the specified due date and time to be eligible to submit a Full Application. DOE will use Letters of Intent to plan for the merit review process. The letter should not contain any proprietary or business-sensitive information. The letter will not be used for down-selection purposes and does not commit an applicant to submit an application.

Each applicant must provide the following information as part of the Letter of Intent:

- Project Title;
- Lead Organization;
- Organization Type (business < 500 employees; business > 1,000 employees; business = 500-1,000 Employees; FFRDC; government-owned, government-operated; nonprofit; university);
- Whether the application has been previously submitted to DOE;
- % of effort contributed by the Lead Organization;
- The Project Team, including:
 - The Principal Investigator (PI) for the prime recipient;
 - Team members (i.e., subrecipients); and
 - Senior/Key Personnel (i.e., individuals who contribute in a substantive, measurable way to the execution of the proposed project);
- Technical Topic or Area; and
- Abstract no longer than 200 words, and should provide a truncated explanation of the proposed project.

*Questions about this FOA? BIL_EGSPilotDemos@ee.doe.gov
Problems with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.*

D. Content and Form of the Full Application

Applicants must complete the following application forms found on the EERE eXCHANGE website at <https://eere-eXCHANGE.energy.gov/>.

Applicants will have approximately 60 days from receipt of the Letter of Intent to prepare and submit a Full Application. The submission deadline for the Full Application remains the date and time stated on the FOA cover page.

All Full Application documents must be marked with the control number issued to the applicant. Applicants will receive a control number upon clicking the “Create Letter of Intent” button in EERE Exchange, and should include that control number in the file name of their Full Application submission (i.e., *Control number_Applicant Name_Full Application*).

i. Full Application Content Requirements

Each Full Application must be limited to a single concept. Full Applications must conform to the following requirements and must not exceed the stated page limits. If Applicants exceed the maximum page lengths indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

Component	File Format	Page Limit	File Name
Technical Volume	PDF	30	ControlNumber_LeadOrganization_TechnicalVolume
Resumes	PDF	2 pages each	ControlNumber_LeadOrganization_Resumes
Letters of Commitment	PDF	1 page each	ControlNumber_LeadOrganization_LOCs
Community Partnership	PDF	10 pages	ControlNumber_LeadOrganization_PartnerDoc
Impacted Indian Tribe	PDF	n/a	ControlNumber_LeadOrganization_IndianTribe
Statement of Project Objectives	MS Word	12	ControlNumber_LeadOrganization_SOPO
SF-424: Application for Federal Assistance	PDF	n/a	ControlNumber_LeadOrganization_App424
Budget Justification Workbook	MS Excel	n/a	ControlNumber_LeadOrganization_Budget_Justification
Summary/Abstract for Public Release	PDF	1	ControlNumber_LeadOrganization_Summary
Summary Slide	MS PowerPoint	1	ControlNumber_LeadOrganization_Slide

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Problems with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.

Subrecipient Budget Justification	MS Excel	n/a	ControlNumber_LeadOrganization_Subrecipient_Budget_Justification
DOE Work Proposal for FFRDC, if applicable (see DOE O 412.1A, Attachment 2)	PDF	n/a	ControlNumber_LeadOrganization_WP
Authorization from cognizant Contracting Officer for FFRDC	PDF	n/a	ControlNumber_LeadOrganization_FFRDCAuth
SF-LLL Disclosure of Lobbying Activities	PDF	n/a	ControlNumber_LeadOrganization_SF-LLL
Foreign Entity Waiver Requests and Foreign Work Waiver Requests	PDF	n/a	ControlNumber_LeadOrganization_Waiver
R&D Community Benefits Plan	PDF	5	ControlNumber_LeadOrganization_CBP
Current and Pending Support	PDF	n/a	ControlNumber_LeadOrganization_CPS
Geothermal Drilling Permits and Legal Rights Documentation	PDF	n/a	ControlNumber_LeadOrganization_Permits_and_Lease
Location(s) of Work	Excel	n/a	ControlNumber_LeadOrganization_LOW
Transparency of Foreign Connections	PDF	n/a	BusinessSensitive_ControlNumber_LeadOrganization_TFC
Potentially Duplicative Funding Notice	PDF	n/a	ControlNumber_LeadOrganization_PDFN

Note: The maximum file size that can be uploaded to the EERE eXCHANGE website is 50MB. See Section IV.B.

DOE provides detailed guidance on the content and form of each component below.

ii. Technical Volume

The Technical Volume must conform to the following content and form requirements. This volume must address the technical review criteria as discussed in Section V. of the FOA. Save the Technical Volume in a single PDF file using the following convention for the title: “ControlNumber_LeadOrganization_TechnicalVolume”.

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume. However, DOE and reviewers are under no obligation to review cited sources.

The Technical Volume to the Full Application may not be more than 30 pages, including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all information in the table below. The applicant should consider the weighting of each of the technical review criteria (see Section V. of the FOA) when preparing the Technical Volume.

The Technical Volume should clearly describe the significance, technical merit, technological risks, and operational risks to the project. Volume must conform to the following content requirements:

Technical Volume Content Requirements	
SECTION/PAGE LIMIT	DESCRIPTION
Cover Page	The cover page should include the project title, the specific FOA Topic Area being addressed (if applicable), both the technical and business points of contact, names of all team member organizations, names of project managers, Senior/Key Personnel and their organizations, the project location(s), and any statements regarding confidentiality.
Project Overview (Approximately 5 % of the Technical Volume)	<p>The Project Overview should contain the following information:</p> <ul style="list-style-type: none"> • Background: The applicant should discuss the background of its organization, including the history, successes, and current research and development status (i.e., the technical baseline) relevant to the technical topic being addressed in the Full Application. • Project Goal: The applicant should describe, at a high level, their planned technical, deployment, community benefit related goals and critical success factors in achieving those goals. • DOE Impact: <ul style="list-style-type: none"> ○ The applicant should discuss the impact that DOE funding with respect to advancement of EGS technologies and the impacts and anticipated benefits that will accrue to the local community, workers on the project including the chance for workers to join, form, or be represented by a labor union, and disadvantaged communities ○ The applicant may also wish to address the engagement and/or support of minority business enterprises, as appropriate. ○ Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other

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 Problems with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.

	<p>public and private sources, is necessary to achieve the project objectives.</p> <ul style="list-style-type: none"> • Overview of how the project team will approach incorporating and documentation of technical & organizational learning opportunities during the pilot demonstration project’s period of performance.
<p>Site and Technology Overview (Approximately 35 % of the Technical Volume)</p>	<p>The Site and Technology Overview should contain two sections, one that provides an overview of the proposed site and the other, that describes the high-level strategy for drilling, stimulation, and utilization of other technologies at the proposed sites to advance GTO goals:</p> <p>Site Information:</p> <ul style="list-style-type: none"> • Site Characterization: The applicant should provide all relevant information and interpretations associated with site characterization needed to support the application. <ul style="list-style-type: none"> ○ Applicants must include a preliminary but thorough analysis of electrical and/or thermal power potential, prior to, and following the planned permeability enhancement activities as part of their Application’s Technical Volume. • Well Information: The applicant should provide all relevant information regarding existing target well(s) as applicable and suitability of the well(s) for stimulation. Any new well(s) should be described with respect to well design, completions, well construction approaches, and locations. The applicant should provide a high-level overview of the field configuration and why the proposed strategy was prioritized over others (e.g., To propose to recompleting one well and drill a new well). • The applicant should identify any potential constraints on community access to natural resources (e.g., water) that the project could create. <p>Workforce Strategy:</p> <ul style="list-style-type: none"> • Knowledge, Skills, and Abilities (KSAs): The Applicant should propose a methodology and approach for documenting and reporting the KSAs of workers engaged in the project. <p>Site Strategy:</p> <ul style="list-style-type: none"> • Drilling Plan: The Applicant should provide an overview of any initial plans on how wells will be recompleting and / or how new wells will be drilled, describing what efficiency measures will be implemented to improve on recent drilling rate improvements at FORGE. • Stimulation and Testing: The applicant should describe the initial plans for stimulation and testing and detail the proposed approach in

	<p>sufficient detail to allow an assessment of the TRL levels of proposed technologies and methods.</p> <ul style="list-style-type: none"> • Technology Advancement: The applicant should provide a detailed description of any other innovative technologies proposed for utilization during the project to help meet FOA Goals (note that site characterization is not a focus of this FOA, except in limited circumstances and under Topic Area 3), including the scientific objectives associated with deployment of that technology. • Risks: Risks should be clearly described in terms of the significance of technological and operational risks specific to the project. Applicants must also provide detailed descriptions of potential outcomes associated with each risk and provide detailed discussion of all relevant mitigatory actions specific to each risk identified. The applicant should discuss the risks associated with meeting GTO electrical and/or thermal power production goals and the feasibility of their project to do so. • Induced Seismicity Mitigation: Applicants should provide their plans for compliance with the “Protocol for Induced Seismicity Associated with Enhanced Geothermal Systems,” and demonstrate an understanding of the importance of clear transparent data and communications on this subject with DOE and stakeholders. • This section should also address if/how the project will secure and/or retain trained and qualified workers to meet goals, as well as how the proposed project location and underlying infrastructure and workforce will contribute to the success of the overall project.
<p>Workplan (Approximately 40% of the Technical Volume)</p>	<p>The Workplan should include a summary of the Project Objectives, Technical Scope, Work Breakdown Structure (WBS), Milestones, Go/No-Go decision points, and Project Schedule. A detailed SOPO is separately requested. The Workplan should contain the following information:</p> <ul style="list-style-type: none"> • Technical Scope Summary: The applicant should provide a summary description of the overall work scope and approach to achieve the objective(s). The overall work scope is to be divided by performance periods that are separated by discrete, approximately annual decision points (see below for more information on Go/No-Go decision points). The applicant should describe the specific expected end result of each performance period, including milestones in the Community Benefits Plan. • WBS and Task Description Summary: The Workplan should describe the work to be accomplished and how the applicant will achieve the milestones, will accomplish the final project goal(s), and will produce all deliverables. The Workplan is to be structured with a hierarchy of performance period (approximately annual), task and subtasks, which is typical of a standard WBS for any project. The Workplan shall contain a concise description of the specific activities to be conducted over the

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	<p>life of the project. The description shall be a full explanation and disclosure of the project being proposed (i.e., a statement such as “we will then complete a proprietary process” is unacceptable). It is the applicant’s responsibility to prepare an adequately detailed task plan to describe the proposed project and the plan for addressing the objectives of this FOA. The summary provided should be consistent with the SOPO. The SOPO will contain a more detailed description of the WBS and tasks.</p> <ul style="list-style-type: none"> • Milestone Summary: The applicant should provide a summary of appropriate milestones throughout the project to demonstrate success. A milestone may be either a progress measure (which can be activity based) or a Specific, Measurable, Achievable, Relevant, and Timely (SMART) technical milestone. SMART milestones should be Specific, Measurable, Achievable, Relevant, and Timely, and must demonstrate a technical achievement rather than simply completing a task. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one milestone per quarter for the duration of the project with at least one SMART technical milestone per year (depending on the project, more milestones may be necessary to comprehensively demonstrate progress). The applicant should also provide the means by which the milestone will be verified. The summary provided should be consistent with the Milestone Summary Table in the SOPO. • Go/No-Go Decision Points (See Section VI.B.xv. for more information on the Go/No-Go Review): The applicant should provide a summary of project-wide Go/No-Go decision points at appropriate points in the Workplan. At a minimum, each project must have at least one project-wide Go/No-Go decision point for each budget period (12 to 18-month period) of the project. See Section VI.B.xiv. The applicant should also provide the specific technical and community benefits plan criteria to be used to evaluate the project at the Go/No-Go decision point. The summary provided should be consistent with the SOPO. Go/No-Go decision points are considered “SMART” and can fulfill the requirement for an annual SMART milestone. • End of Project Goal: The applicant should provide a summary of the end of project goal(s). At a minimum, each project must have one SMART end of project goal. The summary provided should be consistent with the SOPO. • Project Schedule (Gantt Chart or similar): The applicant should provide a schedule for the entire project, including task and subtask durations, milestones, and Go/No-Go decision points. • Buy America Requirements for Infrastructure Projects: Within the first two pages of the Workplan, include a short statement on whether the project will involve the construction, alteration, and/or repair of
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	<p>infrastructure in the United States. See Appendix D for applicable definitions and other information to inform this statement.</p> <ul style="list-style-type: none"> • Project Management: The applicant should discuss the team’s proposed management plan, including the following: <ul style="list-style-type: none"> ○ The overall approach to and organization for managing the work; ○ The roles of each project team member; ○ Any critical handoffs/interdependencies among project team members; ○ The technical and management aspects of the management plan, including systems and practices, such as financial and project management practices; ○ The approach to project risk management, including a plan for securing a qualified workforce and mitigating risks to project performance including but not limited to community or labor disputes; ○ A description of how project changes will be handled; ○ If applicable, the approach to Quality Assurance/Control; ○ How communications will be maintained among project team members.
<p>Technical Qualifications and Resources (Approximately 20% of the Technical Volume)</p>	<p>The Technical Qualifications and Resources should contain the following information:</p> <ul style="list-style-type: none"> • A description of the project team’s unique qualifications and expertise, including those of key subrecipients; • A description of the project team’s existing equipment and facilities, or equipment or facilities already in place on the proposed project site, that will facilitate the successful completion of the proposed project; include a justification of any new equipment or facilities requested as part of the project; • Relevant, previous work efforts, demonstrated innovations, and how these enable the applicant to achieve the project objectives; • The time commitment of the key team members to support the project; • A description of the technical services to be provided by DOE/NNSA FFRDCs, if applicable; • The skills, certifications, or other credentials of the construction and ongoing operations workforce; • For multi-organizational projects, describe succinctly:

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	<ul style="list-style-type: none"> ○ The roles and the work to be performed by the project manager and Senior/Key Personnel at the prime and sub levels; ○ Role of “aspiring PI” in the project; ○ Business agreements between the applicant and sub; ○ How the various efforts will be integrated and managed; ○ Process for making decisions on scientific/technical direction; ○ Publication arrangements; ○ Intellectual property issues; and ○ Internal Team Communication plans.
<p>Appendix 1 to Technical Volume</p>	<p>Appendix 1 to Technical Volume: Communications Plan</p> <p>The Communications Plan should present an overview of how the Team will promote communications and outreach activities with stakeholders and the general public to listen to concerns, provide details on their project plans, and share their successes. Engagement with local stakeholders must begin at the outset of any selected projects and must be maintained on a recurring basis throughout the duration of the project. The initial plan for engagement as well as the pathway towards recruiting an “information officer,” and what their role will entail, can be described in this Appendix.</p>

iii. Resumes

A resume provides information reviewers can use to evaluate an individual’s skills, experience, and potential for leadership within the scientific community. Applicants must submit a resume (limited to two pages) for each Principal Investigator or Lead Project Manager and Senior/Key Personnel that includes the following:

1. Contact information;
2. Education and training: Provide name of institution, major/area, degree, and year for undergraduate, graduate, and postdoctoral training;
3. Research and 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;
4. Awards and honors;
5. 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,

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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;

6. Synergistic activities: List up to five professional and scholarly activities related to the proposed effort; and
7. There should be no lapses in time over the past 10 years or since age 18, whichever period is shorter.

As an alternative to a resume, it is acceptable to use the biographical sketch format approved by the National Science Foundation (NSF). The biographical sketch format may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, also available at <https://nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf>. 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.

Save the resumes in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_Resumes".

iv. Letters of Commitment

Submit letters of commitment from all subrecipient and third-party cost share providers. If applicable, the letter must state that the third party is committed to providing a specific minimum dollar amount or value of in-kind contributions allocated to cost sharing. The following information for each third party contributing to cost sharing should be identified: (1) the name of the organization; (2) the proposed dollar amount to be provided; and (3) the proposed cost sharing type (cash-or in-kind contributions). Each letter must not exceed one page. Save the letters of commitment in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_LOCs".

Letters of support or endorsement for the project from entities that do not have a substantive role in the project will not be accepted.

v. Community Partnership Documentation

In support of the Community Benefits Plan, applicants may submit documentation to demonstrate existing or planned partnerships with community entities, such as organizations that work with local stakeholders

most vulnerable to or affected by the project. Examples of such entities include organizations that carry out workforce development programs, labor unions, Tribal organizations, and community-based organizations that work with disadvantaged communities. The partnership documentation can be a letter on a partner's letterhead outlining the planned partnership and signed by an officer of the entity, a Memorandum of Understanding, or another similar agreement. Such letters must state the specific nature of the partnership and must not be general letters of support. If the applicant intends to enter into Workforce and Community Agreements as part of the Community Benefits Plan, they should include letters from proposed partners. Each letter must not exceed one page. In total, the partnership documentation must not exceed 10 pages. Save the partnership documentation in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_PartnerDoc".

vi. Impacted Indian Tribes Documentation

For any application that potentially impacts Indian Tribes or is on Tribal land³⁹, including when the potentially impacted Indian Tribe is the applicant, applicants are required to submit additional documentation at the time of application, and possibly during negotiation and prior to award. For any project that potentially impacts Indian Tribes, applicants are required to submit documentation demonstrating that an authorized representative⁴⁰ of each potentially impacted Indian Tribe is, at a minimum, aware of the nature of the application and its potential impacts to the relevant Indian Tribes. The notified authorized representative must be holding their position while the award is open for applications, and documentation must demonstrate affirmative awareness of the application (e.g., a delivery record from certified mail, a reply by the authorized representative).

For any project intended to be sited on Tribal land(s) or intersecting with Tribal subsurface rights, applicants are required to submit documentation demonstrating support from the relevant Indian Tribes at the time of application. Documentation of support submitted at the time of application will be considered to also demonstrate awareness of an Indian Tribe (specified above). Documentation may include either:

³⁹ Tribal land is as defined in 25 U.S.C. §§ 3501(2), (3), (4)(A) and (13)

⁴⁰ An authorized representative must be an elected official or designated leader according to the traditions, constitution, or charter of the Indian Tribe, or someone with relevant delegated authority within the Tribal government. Examples include: Chief, Chairman, Chairwoman, Governor, Nation Representative, President, Chief Executive Officer, Chief Financial Officer, Speaker of the Council, Speaker of the Congress, Tribal administrator

- A letter of support from Tribal leadership. The letter must be signed by an authorized representative of the Indian Tribe. The signer(s) must be holding their position while the award is open for applications or negotiations.
- A Tribal Council Resolution, Board resolution (including the Board of Directors of an Alaska Native Corporation (ANC)), or similar act passed by the legislative body of the Tribal government or Board of Directors of an ANC, expressing support for the project.

Applicants are encouraged to reference or include any applicable community benefits agreements in the Tribal support documentation, and to integrate any Tribal support documentation in the community benefits plan as appropriate. For projects not intended to be sited on Tribal land(s) or intersecting with Tribal subsurface rights, but that may have other potential impacts on Tribal resources or reserved rights, letters of support or resolutions of support are strongly encouraged and, depending on the nature of the impact, may be required if selected for negotiation of an agreement. Applicants are encouraged to reach out to Indian Tribes as early as possible in the application process to give Indian Tribes ample time to evaluate and respond.

The following resources may be useful to help determine if a project may impact an Indian Tribe(s) resources or reserved rights and the appropriate contacts. These resources are not exhaustive, and many Indian Tribes have resources or reserved rights which extend beyond their Tribal lands, or are covered within treaties, statutes, or case-law. Applicants are encouraged to do additional research:

- Map of Indian Lands: <https://bia-geospatial-internal.geoplatform.gov/indianlands/>
- Tribal Treaties Database: <https://treaties.okstate.edu/>
- Directory of federally recognized Tribes and Tribal leaders: <https://www.bia.gov/service/tribal-leaders-directory>
- Best Practices for Identifying and Protecting Tribal Treaty Rights, Reserved Rights, and other similar rights in federal regulatory actions: https://www.bia.gov/sites/default/files/dup/inline-files/best_practices_guide.pdf

To help determine if an Indian Tribe's resources or reserved rights may be impacted by the project, applicants must address the following elements. If the applicant is an Indian Tribe, these elements should be addressed to ascertain impacts to Indian Tribes other than the applicant. Applicants do not need to reveal specific details about sacred sites such as specific location or specific ceremonies:

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- Identify any elements of the project that will occur on or near Indian land, Tribal historic sites, or sacred sites and describe its potential impacts to Indian Tribes. Identify the potentially impacted Indian Tribe(s).
- Identify any Tribal mineral rights, subsurface, or water rights at or near the proposed project location. Explain any relevant studies already performed, such as groundwater studies? Identify which Indian Tribe(s) might be impacted. Explain any instances of uncertainty and any potential for subsurface resource migration which has been considered.
- Identify any other proposed actions which may impact an Indian Tribe(s) resources or reserved rights. Tribal resources and reserved rights include, and are not limited to, an Indian Reservation or Land (as defined in 25 U.S.C. § 3501) or intersecting Tribal sub-surface rights, historic homelands from which they were removed, cultural sites, sacred sites, water rights, mineral and other subsurface rights, fishing rights, and hunting rights. Identify the Tribe(s) potentially impacted and any sources of uncertainty or confidentiality.
- Explain any actions taken by the applicant to mitigate or address any potential impacts identified above, including engaging with the potentially impacted Indian Tribe(s), in the application.

Applicants are required to document any efforts taken to identify any potential impacts to Indian Tribes, Indian lands, Alaska Native regional and village land, traditional homelands, Tribal rights, or Tribal historic sites, or sacred sites. This includes any correspondence with Indian Tribes. These documents should be available on request to DOE. An applicant's failure to submit documentation of an Indian Tribe's awareness, or a letter of support, when required as described above, may constitute grounds for determining an application ineligible, non-responsive to the FOA/OT solicitation, not subject to further review and/or not otherwise subject to selection or award.

Any application that may potentially impact Indian Tribe(s) may be shared with the potentially impacted Indian Tribe(s). Applicants should include a Notice of Restriction on Disclosure and Use of Data identifying any business sensitive, trade secrets, proprietary, or otherwise confidential information. Such information shall be used or disclosed only for evaluation of the application or to determine whether the proposed project affects an Indian Tribe(s). If an applicant determines an Indian Tribe(s) will be impacted, the applicant must provide information on the project location, potential impacts and how the applicant will engage with Indian Tribe(s), during the period of performance of the agreement, and, if necessary, after the end of the agreement. Approval by DOE must be obtained before any activities take place that could impact Tribal resources or reserved rights, including but not limited to lands, cultural sites,

sacred sites, water rights, mineral rights, fishing rights, and hunting rights. DOE will determine if formal government-to-government consultation is needed, and DOE will conduct that consultation accordingly, in addition to any engagement by applicant.

vii. Statement of Project Objectives (SOPO)

Applicants must complete a SOPO. A SOPO template is available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. The SOPO, including the Milestone Table, must not exceed 12 pages when printed using standard 8.5" x 11" paper with 1" margins (top, bottom, left, and right) with font not smaller than 12-point (except in figures or tables, which may be 10-point font). Save the SOPO in a single Microsoft Word file using the following convention for the title: "ControlNumber_LeadOrganization_SOPO".

viii. SF-424: Application for Federal Assistance

Applicants must complete the SF-424: Application for Federal Assistance, which is available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. The list of certifications and assurances in Field 21 can be found at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>, under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period and not just the first project year, first phase, or other subset of the project period. Save the SF-424 in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_424".

ix. Budget Justification Workbook

Applicants must complete the Budget Justification Workbook, available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. Applicants must complete each tab of the Budget Justification Workbook for the project, including all work to be performed by the prime recipient and its subrecipients and contractors. Applicants should include costs associated with implementing the various BIL-specific requirements (e.g., Buy America requirements for infrastructure projects, Davis-Bacon, Community Benefits Plan, reporting, oversight) and with required annual audits and incurred cost proposals in their proposed budget documents. Such costs may be reimbursed as a direct or indirect cost. The "Instructions and Summary" included with the Budget Justification Workbook will auto-populate as the applicant enters information into the Workbook. Applicants must carefully read the "Instructions and Summary" tab provided within the Budget Justification Workbook. Save the Budget Justification

Workbook in a single Microsoft Excel file using the following convention for the title: “ControlNumber_LeadOrganization_Budget_Justification”.

x. Summary for Public Release

Applicants must submit a one-page summary of their project that is suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the lead project manager/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (e.g., benefits, outcomes), major participants (for collaborative projects), and the project’s commitments and goals described in the Community Benefits Plan. This document must not include any proprietary or business-sensitive information, as DOE may make it available to the public after selections are made. The summary must not exceed one page when printed, using standard 8.5” x 11” paper with 1” margins (top, bottom, left, and right) with font not smaller than 12-point. Save the Summary for Public Release in a single PDF file using the following naming convention: “ControlNumber_LeadOrganization_Summary”.

xi. Summary Slide

Applicants must provide a single slide summarizing the proposed project. The Summary Slide template is available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/> and must include the following information:

- A technology summary;
- A description of the technology’s impact;
- Proposed project goals;
- Any key graphics (illustrations, charts and/or tables);
- The project’s key idea/takeaway;
- Topline community benefits;
- Project title, prime recipient, PI/LPM, and Senior/Key Personnel information; and
- Requested DOE funds and proposed applicant cost share.

Save the Summary Slide in a single Microsoft PowerPoint file using the following convention for the title: “ControlNumber_LeadOrganization_Slide”.

xii. Subrecipient Budget Justification (if applicable)

Applicants must provide a separate budget justification for each subrecipient that is expected to perform work estimated to be more than \$250,000 or 25% of the total work effort, whichever is less. The budget justification must include the same justification information described in the “Budget Justification” section

above. Save each subrecipient budget justification in a Microsoft Excel file using the following convention for the title:

“ControlNumber_LeadOrganization_Subrecipient_Budget_Justification”.

xiii. Budget for DOE/NNSA FFRDC (if applicable)

If a DOE/NNSA FFRDC is to perform a portion of the work, the applicant must provide a DOE work proposal (WP) in accordance with the requirements in DOE Order 412.1A, Work Authorization System, Attachment 2, available at: <https://www.directives.doe.gov/directives-documents/400-series/0412.1-BOrder-a-chg1-AdmChg>. Save the WP in a single PDF file using the following convention for the title: “ControlNumber_LeadOrganization_WP”.

xiv. Authorization for Non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable)

The federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with the contractor’s authority under its award. Save the Authorization in a single PDF file using the following convention for the title: “ControlNumber_LeadOrganization_FFRDCAuth”.

xv. SF-LLL: Disclosure of Lobbying Activities (required)

Prime recipients and subrecipients may not use any federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

Prime recipients and subrecipients are required to complete and submit SF-LLL, “Disclosure of Lobbying Activities” (<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the application:

- An officer or employee of any federal agency;
- A member of Congress;
- An officer or employee of Congress; or
- An employee of a member of Congress.

Save the SF-LLL in a single PDF file using the following convention for the title: “ControlNumber_LeadOrganization_SF-LLL”.

xvi. Waiver Requests (if applicable)

To ensure that the best international researchers and experts are engaged in these important demonstrations, DOE will allow foreign subcontractors to support prime applicants on this FOA subject. Note that 20% of work completed by foreign subs may be completed outside of the U.S. with an approved waiver, with the remaining 80% must be completed in the U.S.

Foreign Entity Participation

As set forth in Section III, for projects selected under this FOA, all recipients must qualify as domestic entities. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix C lists the information that must be included in a waiver request.

Performance of Work in the United States (Foreign Work Waiver)

As set forth in Section IV.J.iii., all work for the projects selected under this FOA must be performed in the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix C lists the information that must be included in a foreign work waiver request.

Save the Waivers in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_Waiver".

xvii. R&D Community Benefits Plan

The R&D Community Benefits Plan must set forth the applicant's approach to ensuring the federal investments advance the following three objectives: (1) DEIA; (2) contributing to the Justice40 Initiative and other considerations linked with energy and/or environmental justice; and (3) investing in quality jobs. The below sections set forth the content requirements for the R&D Community Benefits Plan, which addresses each of these objectives. Applicants must address all three sections.

For your convenience, a Community Benefits Plan Template is available on EERE eXCHANGE at <https://eere-exchange.energy.gov/>. Applicants are strongly encouraged to use the template to complete their specific Plan. If the template is not used, the Plan must address all of the elements described below, and as outlined in the template.

The applicant's R&D Community Benefits Plan must include at least one Specific, Measurable, Achievable, Relevant, and Timely (SMART) milestone per budget period to measure progress on the proposed actions. The R&D Community

Benefits Plan will be evaluated as part of the technical review process. If a project is selected, the selectee is responsible for developing a Community Benefits Outcomes and Objectives (CBOO) document. DOE will incorporate the CBOO into the award and the recipient must implement the CBOO when carrying out its project. Public transparency around the plan and SMART commitments ensure accountability. As such, DOE plans to make the content of each CBOO available publicly. DOE will evaluate the recipient's progress throughout the life of the award, including as part of the Go/No-Go review process.

The plan should be specific to the proposed project and not a restatement of an organization's policies. Applicants should describe the future implications or a milestone-based plan for identifying future implications of their research on energy and/or environmental justice, including, but not limited to, benefits for the U.S. workforce. These impacts may be uncertain, occur over a long period of time, and/or have many factors within and outside the specific proposed research. Applicants are encouraged to describe the influencing factors and the most likely workforce and energy equity implications of the proposed research if the research is successful, as well as energy and/or environmental justice implications. While some guidance and example activities are provided in the Community Benefits Plan Template, applicants are encouraged to leverage promising practices and develop a plan tailored to their project.

The R&D Community Benefits Plan must not exceed 5 pages. It must be submitted in PDF format using the following convention name for the title: "ControlNumber_LeadOrganization_CBP." This Plan must address the technical review criterion titled "R&D Community Benefits Plan." See Section V. of the FOA.

The R&D Community Benefits Plan must address the following three sections:

1) Diversity, Equity, Inclusion, and Accessibility:

To building a clean and equitable energy economy, it is important that there are opportunities for people of all racial, ethnic, socioeconomic, and geographic backgrounds, sexual orientation, gender identity, persons with disabilities, and those re-entering the workforce from incarceration. This section of the plan must demonstrate how DEIA is incorporated in the technical project objectives. The plan must identify the specific action the applicant would take that integrates into the research goals and project teams. Submitting an institutional DEIA plan without specific integration into the project will be deemed insufficient.

2) Energy Equity (the Justice40 Initiative and other considerations):

This section must articulate the applicant's consideration of long-term equity implications of the research. It must identify how the specific project integrates equity and environmental justice considerations into the project design to support equitable outcomes for affected communities if the innovation is successful. Like cost reductions and commercialization plans, the R&D Community Benefits Plan requires description of the equity implications of the innovation for local affected communities.

3) Quality Jobs:

This section must articulate the applicant's consideration of long-term workforce impacts and opportunities of the research. It must identify how the project is designed and executed to include an understanding of the future workforce needs if the innovation is successful.

xviii. Current and Pending Support

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. As part of the application, the Principal Investigator or Lead Project Manager and all senior/key personnel at the applicant and subrecipient level 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 connections with foreign government-sponsored talent recruitment programs must be identified in current and pending support.

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 and cost share. For pending proposals, provide the total amount of requested funding;
- The award period (start date through end date); and
- The person-months of effort per year dedicated to the award or activity.

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

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. Supporting documents of any identified source of support must be provided to DOE on request, including certified translations of any document.

PIs and senior/key personnel must provide a separate disclosure statement listing the required information above regarding current and pending support. Each individual must sign and date their respective disclosure statement and include the following certification statement:

I, [Full Name and Title], certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil, or administrative penalties for fraud, false statements, false claims, or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. §§ 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

The information may be provided in the approved common disclosure format available at Common Form for Current and Pending (Other) Support (nsf.gov).

Save the Current and Pending Support in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_CPS".

Definitions:

Current and pending support – (a) All resources made available, or expected to be made available, to an individual in support of the individual’s RD&D efforts, regardless of (i) whether the source is foreign or domestic; (ii) whether the resource is made available through the entity applying for an award or directly to the individual; or (iii) whether the resource has monetary value; and (b) includes in-kind contributions requiring a commitment of time and directly supporting the individual’s RD&D efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students. This term has the same meaning as the term Other Support as applied to researchers in NSPM-33: For researchers, Other Support includes all resources made available to a researcher in support of and/or related to all of their professional RD&D efforts, including resources provided directly to the individual or through the organization, and regardless of whether or not they have monetary value (e.g., even if the support received is only in-kind, such as office/laboratory space, equipment, supplies, or employees). This includes resource and/or financial support from all foreign and domestic entities, including but not limited to gifts provided with terms or conditions, financial support for laboratory personnel, and participation of student and visiting researchers supported by other sources of funding.

Foreign Government-Sponsored Talent Recruitment Program – An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to physically relocate to the foreign state for the above purpose. Some programs allow for or encourage continued employment at United States research facilities or receipt of federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to United States entities. Compensation could take many forms, including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.

Senior/key personnel – An individual who contributes in a substantive, meaningful way to the scientific development or execution of a research, development and demonstration (RD&D) project proposed to be carried out with a DOE award.⁴¹

xix. Locations of Work

The applicant must provide a list of locations where project work will be performed by the prime recipient or subrecipient(s) including the following information for each location:

- Location Type
- Location Type Category
- Is this a Principal Place of Performance?
- Prime or Subrecipient Location?
- If Subrecipient, Subrecipient/Community Name
- Facility Name (if applicable)
- Is location in a foreign country?
- Street Address, City, State, 5-Digit Zip Code - +4
- Briefly describe the primary activity at this location or with this population. For example, management headquarters; construction, operations, production; raw materials extraction, etc.
- Latitude/Longitude
- Does the location of work qualify as a disadvantaged community according to the according to the Climate and Economic Justice Screening Tool (CEJST)?
- Does the location or community that will receive benefits qualify as a disadvantaged community according to the Climate and Economic Justice Screening Tool (CEJST)?
- Will a Federally Recognized Tribe or Tribal entity receive benefits?
- Is the location of work sited on Tribal land or does it intersect with Tribal subsurface rights?
- If a geographically defined disadvantaged community, add the census tract number or describe the distributed (dispersed) disadvantaged community served (e.g., migrant workers)
- % of work performed at this location

For your convenience, a Locations of Work template is available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. Applicants are strongly encouraged to use the template. If the template is not used, the submission

⁴¹ 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, graduate students, and those with a postdoctoral role also may be considered Senior/Key Personnel if they meet this definition.

must include all of the elements described above, and as outlined in the template.

Applicants must provide the Locations of Work Documentation as a Microsoft Excel file using the following convention for the title: "Control Number_LeadOrganization_LOW."

xx. Transparency of Foreign Connections

Applicants must provide the following as it relates to the proposed recipient and subrecipients. Include a separate disclosure for the applicant and each proposed subrecipient. U.S. National Laboratories, domestic government entities, and institutions of higher education are only required to respond to items 1, 2 and 9, and if applying as to serve as the prime recipient, must provide complete responses for project team members that are not U.S. National Laboratories, domestic government entities, or institutions of higher education.

1. Entity name, website address, and physical address;
2. The identity of all owners, principal investigators, project managers, and senior/key personnel who are a party to any *Foreign Government-Sponsored Talent Recruitment Program* of a foreign country of risk (i.e., China, Iran, North Korea, and Russia);
3. The existence of any joint venture or subsidiary that is based in, funded by, or has a foreign affiliation with any foreign country of risk;
4. Any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity;
5. Percentage, if any, that the proposed recipient or subrecipient has foreign ownership or control;
6. Percentage, if any, that the proposed recipient or subrecipient is wholly or partially owned, directly or indirectly, by an entity in a foreign country of risk;
7. Percentage, if any, of venture capital or institutional investment by an entity that has a general partner or individual holding a leadership role in such entity who has a foreign affiliation with any foreign country of risk;
8. Any technology licensing or intellectual property sales to a foreign country of risk, during the 5-year period preceding submission of the proposal;
9. Any foreign equipment that will be used on the project:
 - a. Equipment originally made or manufactured in a foreign country of risk (including relabeled or rebranded equipment).

- b. Coded equipment where the source code is written in a foreign country of risk.
 - c. Equipment from a foreign country of risk that will be connected to the internet or other remote communication system.
 - d. Any companies from a foreign country of risk that will have physical or remote access to any part of the equipment used on the project after delivery;
10. Any foreign business entity, offshore entity, or entity outside the United States related to the proposed recipient or subrecipient;
 11. Complete list of all directors (and board observers), including their full name, citizenship and shareholder affiliation, date of appointment, duration of term, as well as a description of observer rights as applicable;
 12. Complete capitalization table for your entity, including all equity interests (including LLC and partnership interests, as well as derivative securities). Include both the number of shares issued to each equity holder, as well as the percentage of that series and all equity on a fully diluted basis. Identify the principal place of incorporation (or organization) for each equity holder. If the equity holder is a natural person, identify the citizenship(s). If the recipient or subrecipient is a publicly traded company, provide the above information for shareholders with an interest greater than 5%;
 13. A summary table identifying all rounds of financing, the purchase dates, the investors for each round, and all the associated governance and information rights obtained by investors during each round of financing; and
 14. An organization chart to illustrate the relationship between your entity and the immediate parent, ultimate parent, and any intermediate parent, as well as any subsidiary or affiliates. Identify where each entity is incorporated.

DOE reserves the right to request additional or clarifying information based on the information submitted.

Save the Transparency of Foreign Connections information in a single PDF file using the following convention for the title:
"ControlNumber_LeadOrganization_TFC."

xxi. Potentially Duplicative Funding Notice

If the applicant or project team member has other active awards of federal funds, the applicant must determine whether the activities of those awards potentially overlap with the activities set forth in its application to this FOA. If there is a potential overlap, the applicant must notify DOE in writing of the

potential overlap and state how it will ensure any project funds (i.e., recipient cost share and federal funds) will not be used for identical cost items under multiple awards. Likewise, for projects that receive funding under this FOA, if a recipient or project team member receives any other award of federal funds for activities that potentially overlap with the activities funded under the DOE award, the recipient must promptly notify DOE in writing of the potential overlap and state whether project funds from any of those other federal awards have been, are being, or are to be used (in whole or in part) for one or more of the identical cost items under the DOE award. If there are identical cost items, the recipient must promptly notify the DOE Contracting Officer in writing of the potential duplication and eliminate any inappropriate duplication of funding.

Save the Potentially Duplicative Funding Notice in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_PDFN."

xxii. Geothermal Drilling Permit and Geothermal Leasehold/Legal Rights Documentation

Applicants must submit copies of existing geothermal drilling permits, or other relevant documents indicating a clear pathway to securing necessary drilling permits within the timeframe of Phase I. Applicants must also provide sufficient legal documentation to demonstrate that they have the legal surface and subsurface rights necessary for geothermal resource extraction at the proposed site at the time of application, or must provide clear documentation that surface and subsurface rights for geothermal resource extraction can be obtained within the timeframe of Phase 1 of the project. Letters of support from partners or subcontractors do not take the place of legal documentation of surface and subsurface rights.

E. Post Selection Information Requests

If selected for award negotiations, DOE reserves the right to require that selected applicants provide additional or clarifying information regarding the application submissions, the project, the project team, the award requirements, and any other matters related to anticipated award. The following is a list of examples of information that may be required:

- Personnel proposed to work on the project and collaborating organizations (See Section VI.B.xviii. Participants and Collaborating Organizations);
- Current and Pending Support (See Sections IV.D.xvii. and VI.B.xxi. Current and Pending Support);
- Community Benefits Outcomes and Objectives (See Section IV.E.xvii);

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- An Intellectual Property Management Plan (if applicable) describing how the project team/consortia members will handle intellectual property rights and issues between themselves while ensuring compliance with federal intellectual property laws, regulations, and policies in accordance with Section VI.B.x. Intellectual Property Management Plan;
 - A Data Management Plan (if applicable) describing how all research data displayed in publications resulting from the proposed work will be digitally accessible at the time of publications, in accordance with Section VI.B.xxi.;
 - Indirect cost information;
 - Other budget information;
 - Letters of Commitment from third parties contributing to cost share, if applicable;
 - Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5);
 - Information for the DOE Office of Civil Rights to process assurance reviews under 10 CFR 1040;
 - Representation of Limited Rights Data and Restricted Software, if applicable;
 - Information related to Davis-Bacon Act requirements;
 - Information related to any proposed Workforce and Community Agreement, as defined above in “Community Benefits Plan: Job Quality and Equity,” that applicants may have made with the relevant community;
 - Any proposed or required Project Labor Agreements;
 - Construction Workforce Continuity Plan;
 - Operations Workforce Continuity Plan; and
 - Environmental Questionnaire.

F. Unique Entity Identifier (UEI) and System for Award Management (SAM)

Each applicant (unless the applicant is an individual or federal awarding agency that is excepted from those requirements under 2 CFR 25.110(b) or (c), or has an exception approved by the federal awarding agency under 2 CFR 25.110(d)) is required to: (1) Register in the SAM at <https://www.sam.gov> before submitting an application; (2) provide a valid UEI in the application; and (3) maintain an active SAM registration with current information when the applicant has an active federal award or an application or plan under consideration by a federal awarding agency. DOE may not make a federal award to an applicant until the applicant has complied with all applicable UEI and SAM requirements. If an applicant has not fully complied with the requirements by the time DOE is ready to make a federal award, DOE will determine that the applicant is not qualified to receive a federal award and use that determination as a basis for making a federal award to another applicant.

NOTE: Due to the high demand of UEI requests and SAM registrations, entity legal business name and address validations are taking longer than expected to process. Entities should start the UEI and SAM registration process as soon as possible. If entities have technical difficulties with the UEI validation or SAM registration process, they should use the [HELP](#) feature on [SAM.gov](https://www.sam.gov). SAM.gov will work entity service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue. Additional entity validation resources can be found here: [GSAFSD Tier 0 Knowledge Base - Validating your Entity](#).

G. Submission Dates and Times

All required submissions must be submitted in EERE eXCHANGE no later than 5 p.m. ET on the dates provided on the cover page of this FOA.

H. Intergovernmental Review

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

I. Funding Restrictions

i. Allowable Costs

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable federal cost principles. Pursuant to 2 CFR 910.352, the cost principles in the Federal Acquisition Regulations (48 CFR 31.2) apply to for-profit

entities. The cost principles contained in 2 CFR Part 200, Subpart E apply to all entities other than for-profits.

ii. **Pre-Award Costs**

Applicants selected for award negotiations (selectee) must request prior written approval to charge pre-award costs. Pre-award costs are those incurred prior to the effective date of the federal award directly pursuant to the negotiation and in anticipation of the federal award where such costs are necessary for efficient and timely performance of the scope of work. Such costs are allowable only to the extent that they would have been allowable if incurred after the date of the federal award and **only** with the written approval of the federal awarding agency, through the DOE Contracting Officer.

Pre-award costs cannot be incurred prior to the Selection Official signing the Selection Statement and Analysis.

Pre-award expenditures are made at the selectee's risk. DOE is not obligated to reimburse costs: (1) in the absence of appropriations; (2) if an award is not made; or (3) if an award is made for a lesser amount than the selectee anticipated.

1. **National Environmental Policy Act (NEPA) Requirements Related to Pre-Award Costs**

DOE's decision whether and how to distribute federal funds under this FOA is subject to NEPA. Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to DOE completing the NEPA review process.

DOE does not guarantee or assume any obligation to reimburse pre-award costs incurred prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that DOE determines may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the applicant is doing so at risk of not receiving federal funding for its project and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer overrides the requirement to obtain the written authorization from the Contracting Officer prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives.

Likewise, if an application is selected for negotiation of award, and the prime recipient elects to undertake activities that are not authorized for federal funding by the Contracting Officer in advance of DOE completing a NEPA review, the prime recipient is doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

iii. Performance of Work in the United States (Foreign Work Waiver)

1. Requirement

All work performed under awards issued under this FOA must be performed in the United States. The prime recipient must flow down this requirement to its subrecipients.

2. Failure to Comply

If the prime recipient fails to comply with the Performance of Work in the United States requirement, DOE may deny reimbursement for the work conducted outside the United States and such costs may not be recognized as allowable recipient cost share. The prime recipient is responsible should any work under this award be performed outside the United States, absent a waiver, regardless of whether the work is performed by the prime recipient, subrecipients, contractors or other project partners.

3. Waiver

To seek a foreign work waiver, the applicant must submit a written waiver request to DOE. Appendix C lists the information that must be included in a request for a foreign work waiver.

Save the waiver request(s) in a single PDF file. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

iv. Construction

Recipients are required to obtain written authorization from the Contracting Officer before incurring any major construction costs. Recipients are encouraged to display DOE Investing in America signage during and after construction. Guidance can be found at: (<https://www.energy.gov/design>). Proposed signage costs that meet these specifications are an allowable cost and should be included in the proposed project budget.

v. Foreign Travel

Foreign travel costs are not allowable under this FOA.

vi. Equipment and Supplies

To the greatest extent practicable, all equipment and products purchased with funds made available under this FOA should be American-made. This requirement does not apply to used or leased equipment.

Property disposition may be required at the end of a project if the current fair market value of property exceeds \$5,000. For-profit entity disposition requirements are set forth at 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR 200.310 – 200.316.

vii. Build America Buy America Requirements for Infrastructure Projects

Pursuant to the Build America Buy America Act, subtitle IX of BIL (Buy America or BABA), and in accordance with 2 CFR Part 184, no funds for federal financial assistance which is subject to BABA requirements may be used for a project unless:

- All iron and steel used in the infrastructure work are produced in the United States;
- All manufactured products used in the project are produced in the United States; and
- All construction materials used in the infrastructure work are manufactured in the United States.

Whether a given project must apply this requirement is project-specific and dependent on several factors, such as the recipient's entity type, whether the work involves "infrastructure," as defined in Section 70914 of the BIL, and whether the infrastructure in question is publicly owned or serves a public function.

Applicants are strongly encouraged to consult Appendix D of this FOA to determine whether their project may have to apply this requirement, both to make an early determination as to the need of a waiver, as well as to determine what impact, if any, this requirement may have on the proposed project's budget.

BABA requirements apply to DOE prime recipients that are "non-Federal entities." In accordance with [OMB Memorandum M-24-02](#) and 2 CFR 200.1, the term "non-Federal entity" includes states, local governments, territories, Indian

Tribes, Institutes of Higher Education or non-profit organizations. DOE does not apply BABA requirements to for-profit entities.

Subawards should conform to the terms of the prime award from which they flow; in other words, for-profit prime recipients are not required to flow down these Buy America requirements to subrecipients, even if those subrecipients are non-Federal entities as defined above. Conversely, prime recipients which are non-Federal entities must flow the Buy America requirements down to all subrecipients, even if those subrecipients are for-profit entities.

The DOE financial assistance agreement will require each recipient to: (1) fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) fulfill the commitments made in its application regarding the procurement of other key component metals and domestically manufactured products that are deemed available in sufficient and reasonably available quantities or of a satisfactory quality at the time of award negotiation. Applicants may seek waivers of these requirements in very limited circumstances and for good cause shown. Further details on requesting a waiver can be found in Appendix D and the terms and conditions of an award.

Applicants are strongly encouraged to consult Appendix D and 2 CFR Part 184 for more information.

viii. Davis-Bacon Act Requirements

Projects awarded under this FOA will be funded under Division D of BIL. Accordingly, per Section 41101 of that law, all laborers and mechanics employed by the recipient, subrecipients, contractors, or subcontractors in the performance of construction, alteration, or repair work funded in whole or in part under this FOA shall be paid wages at rates not less than those prevailing on similar projects in the locality, as determined by the Secretary of Labor in accordance with Subchapter IV of Chapter 31 of Title 40, United States Code commonly referred to as the Davis-Bacon Act (DBA).

Applicants shall provide written assurance acknowledging the DBA requirements above, confirming that the laborers and mechanics performing construction, alteration, or repair work on projects funded in whole or in part by awards made as a result of this FOA are paid or will be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by Subchapter IV of Chapter 31 of Title 40, United States Code (Davis-Bacon Act).

Applicants acknowledge that they will comply with all the Davis-Bacon Act requirements, including but not limited to:

- (1) Ensuring that the wage determination(s) and appropriate Davis-Bacon clauses and requirements are flowed down to and incorporated into any applicable subrecipient or contract awards;
- (2) Ensuring that if wage determination(s) and appropriate Davis-Bacon clauses and requirements are improperly omitted from subrecipient or contract awards, the applicable wage determination(s) and clauses are retroactively incorporated to the start of performance;
- (3) Being responsible for compliance by any subrecipient or contractor with the Davis-Bacon labor standards;
- (4) Receiving and reviewing certified weekly payrolls submitted by all subrecipients or contractors for accuracy and to identify potential compliance issues;
- (5) Maintaining original certified weekly payrolls for three years after the completion of the project and making those payrolls available to DOE or the U.S. Department of Labor (DOL) upon request, as required by 29 CFR 5.6(a)(2);
- (6) Conducting payroll and job-site reviews for construction work, including interviews with employees, with such frequency as may be necessary to assure compliance by its subrecipients or contractors and as requested or directed by DOE;
- (7) Cooperating with any authorized representative of DOL in its inspection of records, interviews with employees, and other actions undertaken as part of a DOL investigation;
- (8) Posting in a prominent and accessible place the wage determination(s) and DOL Publication: WH-1321, Notice to Employees Working on Federal or Federally Assisted Construction Projects;
- (9) Notifying the Grants/Contracting Officer of all labor standards issues, including all complaints regarding incorrect payment of prevailing wages and/or fringe benefits, received from recipient, subrecipient, contractor, or subcontractor employees; significant labor standards violations, as defined in 29 CFR 5.7; disputes concerning labor standards pursuant to 29 CFR Parts 4,

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6, and 8 and as defined in FAR 52.222-14; disputed labor standards determinations; DOL investigations; or legal or judicial proceedings related to the labor standards under this award, subrecipient award, contract or subcontract; and

(10) Preparing and submitting to the Grants/Contracting Officer, the Office of Management and Budget Control Number 1910-5165, Davis Bacon Semi-Annual Labor Compliance Report, by April 21 and October 21 of each year.

Recipients of funding under this FOA will also be required to undergo Davis-Bacon Act compliance training and maintain competency in Davis-Bacon Act compliance. The Grants/Contracting Officer will notify the recipient of any DOE-sponsored Davis-Bacon Act compliance trainings. DOL offers free Prevailing Wage Seminars several times a year that meet this requirement, at <https://www.dol.gov/agencies/whd/government-contracts/construction/seminars/events>.

For additional guidance on how to comply with the Davis-Bacon provisions and clauses, see <https://www.dol.gov/agencies/whd/government-contracts/construction> and <https://www.dol.gov/agencies/whd/government-contracts/protections-for-workers-in-construction>.

Recipients of funding under this FOA must ensure the timely submission of weekly certified payrolls as part of its compliance with the Davis-Bacon Act.

DOE has contracted with [LCPtracker](#), a third-party DBA electronic payroll compliance software application. A waiver for the use of LCPtracker may be granted to a particular recipient if they are unable or limited in their ability to use or access the system. LCPtracker allows for certified payroll reports and workforce data to be uploaded electronically, 24 hours a day, 7 days per week and currently partners with several commercially available payroll systems. If a recipient uses a different payroll system, LCPtracker provides a free, spreadsheet template they can use to map out their payroll file, which would allow them to upload their employee and payroll data into the system. LCPtracker validation system checks payrolls for federal Davis-Bacon prevailing wage requirements by flagging mathematical errors or omission discrepancies for the recipient to review on a report. Examples include base hourly rate, total hourly rate, overtime, doubletime, apprentice approval, and fringe benefit contributions. Additionally, LCPtracker utilizes industry standard eSignature technology, thus allowing recipients to electronically sign payroll reports versus using a wet signature. Individual program offices will coordinate with recipients on access and training.

For more information, visit [Davis-Bacon Act Requirements for Recipients of Bipartisan Infrastructure Law Funding](#)

ix. Lobbying

Recipients and subrecipients may not use any federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

Recipients and subrecipients are required to complete and submit SF-LLL, “Disclosure of Lobbying Activities” (<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the application:

- An officer or employee of any federal agency;
- A Member of Congress;
- An officer or employee of Congress; or
- An employee of a Member of Congress.

x. Risk Assessment

Pursuant to 2 CFR 200.206, DOE will conduct an additional review of the risk posed by applications submitted under this FOA. Such risk assessment will consider:

1. Financial stability;
2. Quality of management systems and ability to meet the management standards prescribed in 2 CFR 200 as amended and adopted by 2 CFR 910;
3. History of performance;
4. Audit reports and findings; and
5. The applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-federal entities

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

Depending on the severity of the findings and whether the findings were resolved, DOE may elect not to fund the applicant.

In addition to this review, DOE must comply with the guidelines on government-wide suspension and debarment in 2 CFR 180 and must require non-federal entities to comply with these provisions. These provisions restrict federal awards, subawards and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in federal programs or activities.

Further, as DOE invests in critical infrastructure and funds critical and emerging technology areas, DOE also considers possible threats to United States research, technology, and economic security from undue foreign government influence when evaluating risk. If high risks are identified and cannot be sufficiently mitigated, DOE may elect to not fund the applicant. As part of the research, technology, and economic security risk review, DOE may contact the applicant and/or proposed project team members for additional information to inform the review.

xi. Invoice Review and Approval

DOE employs a risk-based approach to determine the level of supporting documentation required for approving invoice payments. Recipients may be required to provide some or all of the following items with their requests for reimbursement:

- Summary of costs by cost categories;
- Timesheets or personnel hours report;
- Proof of compliance with the Davis-Bacon Act and electronic submittals of certified payroll reports;
- Invoices/receipts for all travel, equipment, supplies, contractual, and other costs;
- UCC filing proof for equipment acquired with project funds by for-profit recipients and subrecipients;
- Explanation of cost share for invoicing period;
- Analogous information for some subrecipients; and
- Other items as required by DOE.

xii. Prohibition Related to Foreign Government-Sponsored Talent Recruitment Programs

a. Prohibition

Persons participating in a *Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk* are prohibited from participating in projects selected for federal funding under this FOA. Should an award result

from this FOA, the recipient must exercise ongoing due diligence to reasonably ensure that no individuals participating on the DOE-funded project are participating in a *Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk*. Consequences for violations of this prohibition will be determined according to applicable law, regulations, and policy. Further, the recipient must notify DOE within five (5) business days upon learning that an individual on the project team is or is believed to be participating in a foreign government talent recruitment program of a foreign country of risk. DOE may modify and add requirements related to this prohibition to the extent required by law.

b. Definitions

- 1. Foreign Government-Sponsored Talent Recruitment Program.** An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to relocate physically to the foreign state for the above purpose. Some programs allow for or encourage continued employment at United States research facilities or receipt of federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to U.S. entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.
- 2. Foreign Country of Risk.** DOE has designated the following countries as foreign countries of risk: Iran, North Korea, Russia, and China. This list is subject to change.

xiii. Affirmative Action and Pay Transparency Requirements

All applicants must comply with all applicable federal labor and employment laws, including but not limited to Title VII of the Civil Rights Act of 1964, the Fair

Labor Standards Act, the Occupational Safety and Health Act, and the National Labor Relations Act, which protects employees' right to bargain collectively and engage in concerted activities for the purpose of workers' mutual aid or protection.

All federally assisted construction contracts exceeding \$10,000 annually will be subject to the requirements of Executive Order 11246, Equal Employment Opportunity:

(1) Recipients, subrecipients, contractors, and subcontractors are prohibited from discriminating in employment decisions on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin.

(2) Recipients and contractors are required to take affirmative action to ensure that equal opportunity is provided in all aspects of their employment. This includes flowing down the appropriate language to all subrecipients, contractors, and subcontractors.

(3) Recipients, subrecipients, contractors, and subcontractors are prohibited from taking adverse employment actions against applicants and employees for asking about, discussing, or sharing information about their pay or, under certain circumstances, the pay of their co-workers.

DOL's Office of Federal Contractor Compliance Programs (OFCCP) uses a neutral process to schedule compliance evaluations. Consult OFCCP's Technical Assistance Guide⁴² to gain an understanding of the requirements and possible actions the recipients, subrecipients, contractors, and subcontractors must take. Additional guidance may also be found in the National Policy Assurances, produced by DOE.

xiv. Foreign Collaboration Considerations

- a. Consideration of new collaborations with foreign entities, organizations, and governments. The recipient will be required to provide DOE with advanced written notification of any potential collaboration with foreign entities, organizations, or governments in connection with its DOE-funded award scope. The recipient will then be required to await further guidance from DOE prior to

⁴² See OFCCP's Technical Assistance Guide at:

<https://www.dol.gov/sites/dolgov/files/ofccp/Construction/files/ConstructionTAG.pdf?msclkid=9e397d68c4b111ec9d8e6fecb6c710ec> Also see the National Policy Assurances <http://www.nsf.gov/awards/managing/rtc.jsp>

contacting the proposed foreign entity, organization, or government regarding the potential collaboration or negotiating the terms of any potential agreement.

- b. Existing collaborations with foreign entities, organizations, and governments. The recipient will be required to provide DOE with a written list of all existing foreign collaborations in which has entered in connection with its DOE-funded award scope.
- c. Description of collaborations that should be reported. In general, a collaboration will involve some provision of a thing of value to, or from, the recipient. A thing of value includes but may not be limited to all resources made available to, or from, the recipient in support of and/or related to the DOE award, regardless of whether or not they have monetary value. Things of value also may include in-kind contributions (such as office/laboratory space, data, equipment, supplies, employees, students). In-kind contributions not intended for direct use on the DOE award but resulting in provision of a thing of value from or to the DOE award must also be reported. Collaborations do not include routine workshops, conferences, use of the recipient's services and facilities by foreign investigators resulting from its standard published process for evaluating requests for access, or the routine use of foreign facilities by awardee staff in accordance with the recipient's standard policies and procedures.

V. Application Review Information

A. Technical Review Criteria

i. Full Applications

Applications will be evaluated against the technical review criteria shown below. All sub-criteria are of equal weight.

Criterion 1: Technical Merit, Innovation, and Impact (45%)

This criterion involves consideration of the following factors:

Technical Merit and Innovation

- Degree to which existing site characterization data supports the planned EGS demonstration;
- Degree to which existing wells are available to substantiate site characterization;
- Degree to which existing wells can be used for stimulation activities and the level of workover / recompletion needed for wells to be suitable for stimulation;
- For projects requiring new wells, the degree to which innovative drilling approaches are incorporated to reduce costs and increase average daily Rate-of-Penetration;
- Degree to which the stimulation approach is demonstrated to yield production potential required for the respective Topic Areas (desired but not required in Topic Area 3);
- Degree to which the stimulation plan incorporates methods and technologies that will support the proposed stimulation approach;
- The current state of permitting and the degree to which the proposed location will be fully permitted within Phase 1 of the project;
- For those projects proposing electrical power generation the degree to which the project will result in economically viable electrical power;
- For those projects proposing thermal power production the degree to which the project will result in economically viable thermal power production;
- Extent to which the proposed stimulation process incorporates multi-zone stimulation while presenting a technology that is at TRL 6 (multi-zone stimulation is not required in Topic Area 3);
- Degree to which the proposed drilling, stimulation, and other operational plans are clearly described, including adequate discussion of technological and operational risks specific to all proposed field activities, as well as mitigatory actions and/or contingencies;

- Extent to which the application specifically and convincingly demonstrates how the applicant will move the state-of-the-art to the proposed advancement; and
- Sufficiency of technical detail in the application to assess whether the proposed work is scientifically meritorious, including relevant data, calculations and discussion of prior work with analyses that support the viability of the proposed work.

Impact of Technology Advancement

- Extent to which the project supports the topic area objectives and target specifications and metrics; and
- Potential impact of the project on advancing the state of the art.

Project Management

- Adequacy, reasonableness, and soundness of the project schedule, as well as annual Go/No-Go decisions prior to a budget period continuation application, interim milestones, and metrics to track process;
- Adequacy of the identification of risks, including labor and community opposition or disputes, and “timely” and appropriate strategies for mitigation and resolution; and
- Soundness of a plan to expeditiously address environmental, siting, and other regulatory requirements for the project.

Criterion 2: Project Demonstration and Market Transformation Plan (20%)

This criterion involves consideration of the following factors:

Demonstration Approach, Workplan, and SOPO

- Description of benefits from technical, organizational, and market learning opportunities of demonstration efforts in complex geothermal settings;
- Degree to which the approach and critical path have been clearly described and thoughtfully considered; and
- Degree to which the task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed Workplan and SOPO will succeed in meeting the project goals.

Workforce

- Extent to which there is clarity and appropriate allocation of resources to documenting the workforce KSAs of demonstration projects.

Identification of Technical Risks

- Discussion and demonstrated understanding of the key technical risk areas involved in the proposed work and the quality of the mitigation strategies to address them.

Baseline, Metrics, and Deliverables

- Level of clarity in the definition of the baseline, metrics, and milestones; and
- Relative to a clearly defined project baseline, the strength of the quantifiable metrics, milestones, and mid-point deliverables defined in the application, such that meaningful interim progress will be made.

Market Transformation Plan

- Estimation of electrical and/or thermal power potential with considerations and analysis of the size of the market opportunities (local and regional scales), characterization of existing grid and transmission infrastructure along with known or perceived barriers to market penetration and mitigation plans; and
- Comprehensiveness of market transformation plan including but not limited to project-level economic analysis (e.g., levelized cost of electricity (LCOE)), market intelligence identifying recent Power Purchase Agreements (PPAs), commercialization timeline, legal/regulatory considerations including permitting timelines, intellectual property, and infrastructure requirements.

Criterion 3: Team and Resources (20%)

This criterion involves consideration of the following factors:

- Capability of the Principal Investigator(s) and the proposed team to address all aspects of the proposed work with a high probability of success;
- The qualifications and relevant expertise of the individuals on the team with respect to managing large-scale demonstration projects;
- Diversity of expertise and perspectives of the team and the inclusion of industry partners that will amplify impact;
- Sufficiency of the facilities to support the work;
- The clear identification of key personnel including project management experts to run demonstrations and information officers to communicate directly with stakeholders;
- Degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further demonstration, development and commercial deployment of the proposed technologies;

- Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan; and
- Reasonableness of the budget and spend plan for the proposed project and objectives.

Criterion 4: Community Benefits Plan (15%)

This criterion involves consideration of the following factors:

Diversity, Equity, Inclusion, and Accessibility

- Clear articulation of the project's goals related to diversity, equity, inclusion, and accessibility;
- Quality of the project's DEIA goals, as measured by the goals' depth, breadth, likelihood of success, inclusion of appropriate and relevant SMART milestones, and overall project integration;
- Degree of commitment and ability to track progress toward meeting each of the DEIA goals; and
- Extent of engagement of nonprofit or community-based organizations that represent disadvantaged communities or underrepresented populations as a core element of their mission, or engagement of Minority Serving Institutions (MSIs), underrepresented businesses, or Tribal.

Energy Equity (the Justice40 Initiative and other considerations)

- Clear workplan tasks, staffing, research, and timeline for engaging energy equity stakeholders and/or evaluating the possible near- and long-term implications of the project for the benefit of the American public, including but not limited to public health and public prosperity benefits;
- Approach, methodology, and expertise articulated in the plan for addressing energy equity and justice issues associated with the technology innovation; and
- Likelihood that the plan will result in improved understanding of distributional public benefits and costs related to the innovation if successful.

Quality Jobs

- Clear and comprehensive workplan tasks, staffing, research, and timeline for engaging workforce stakeholders and/or evaluating the possible near and long-term implications of the project for the U.S. workforce;

- Approach to document the knowledge, skills, and abilities of the workforce required for successful commercial deployment of innovations resulting from this research; and
- Likelihood that the plan will result in improved understanding of the workforce implications related to the innovation if successful;

B. Standards for Application Evaluation

Applications that are determined to be eligible will be evaluated in accordance with this FOA, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "DOE Merit Review Guide for Financial Assistance," effective September 2020, which is available at:

<https://energy.gov/management/downloads/merit-review-guide-financial-assistance-and-unsolicited-proposals-current>.

C. Other Selection Factors

i. Program Policy Factors

In addition to the above criteria, the Selection Official may consider the following program policy factors in determining which Full Applications to select for award negotiations:

- The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA;
- The degree to which the proposed project, including proposed cost share, optimizes the use of available DOE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to accelerate demonstration and commercialization and overcome key market barriers;
- The degree to which the proposed project is likely to lead to increased high-quality employment and manufacturing in the United States;
- The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty;
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications);

- The degree to which the proposed project incorporates applicant or team members from Minority Serving Institutions (e.g., Historically Black Colleges and Universities (HBCUs)/Other Minority Institutions (OMIs)); and partnerships with Minority Business Enterprises, minority-owned businesses, woman-owned businesses, veteran-owned businesses, or Indian tribes;
- The degree to which the proposed project will lead to quality job creation in the near and long-term;
- The degree to which the proposed project maximizes benefits to disadvantaged communities;
- The degree to which the proposed project minimizes environmental impacts to disadvantaged communities;
- The degree to which environmental or regulatory permitting uncertainties will impact project timelines and success;
- The degree to which the proposed project collectively represents a diversity of applicant types and sizes of applicant organizations;
- The degree to which the project’s solution or strategy will maximize deployment or replication;
- The degree to which the project supports advancing the technology pathways identified in the Enhanced Geothermal Shot⁴³ roadmap; and
- The degree to which the project promotes increased coordination with nongovernmental entities for demonstration of technologies and research applications to facilitate technology transfer.

D. Evaluation and Selection Process

i. Overview

The evaluation process consists of multiple phases; each includes an initial eligibility review and a thorough technical review. Rigorous technical reviews of eligible submissions are conducted by reviewers that are experts in the subject matter of the FOA. Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as program policy factors, and risk reviews, in determining which applications to select.

ii. Pre-Selection Interviews

As part of the evaluation and selection process, DOE may invite one or more applicants to participate in pre-selection interviews. Pre-selection interviews are distinct from and more formal than pre-selection clarifications (See Section V.D.iii. of the FOA). The invited applicant(s) will meet with DOE representatives

⁴³ Enhanced Geothermal Shot: <https://www.energy.gov/eere/geothermal/enhanced-geothermal-shot>

to provide clarification on the contents of the Full Applications and to provide DOE an opportunity to ask questions regarding the proposed project. The information provided by applicants to DOE through pre-selection interviews contributes to DOE's selection decisions.

DOE will arrange to meet with the invited applicants in person at DOE's offices or a mutually agreed upon location. DOE may also arrange site visits at certain applicants' facilities. In the alternative, DOE may invite certain applicants to participate in a one-on-one conference with DOE via webinar, videoconference, or conference call.

DOE will not reimburse applicants for travel and other expenses relating to the pre-selection interviews, nor will these costs be eligible for reimbursement as pre-award costs.

Participation in pre-selection interviews with DOE does not signify that applicants have been selected for award negotiations.

iii. Pre-Selection Clarification

DOE may determine that pre-selection clarifications are necessary from one or more applicants. Pre-selection clarifications are distinct from and less formal than pre-selection interviews. These pre-selection clarifications will solely be for the purposes of clarifying the application. The pre-selection clarifications may occur before, during or after the merit review evaluation process. Information provided by an applicant that is not necessary to address the pre-selection clarification question will not be reviewed or considered. Typically, a pre-selection clarification will be carried out through either written responses to DOE's written clarification questions or video or conference calls with DOE representatives.

The information provided by applicants to DOE through pre-selection clarifications is incorporated in their applications and contributes to the merit review evaluation and DOE's selection decisions. If DOE contacts an applicant for pre-selection clarification purposes, it does not signify that the applicant has been selected for negotiation of award or that the applicant is among the top ranked applications.

DOE will not reimburse applicants for expenses relating to the pre-selection clarifications, nor will these costs be eligible for reimbursement as pre-award costs.

iv. Recipient Responsibility and Qualifications

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 responsibility and qualification information about the applicant that is in the entity information domain in [SAM.gov](https://sam.gov) (see 41 U.S.C. § 2313).

The applicant, at its option, may review information in the entity information domain in [SAM.gov](https://sam.gov) and comment on any information about itself that a federal awarding agency previously entered and is currently in the entity information domain in [SAM.gov](https://sam.gov).

DOE will consider any written comments by the applicant, in addition to the other information in the entity information domain in [SAM.gov](https://sam.gov), 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 as described in 2 CFR 200.206.

v. Selection

The Selection Official may consider the technical merit, the Federal Consensus Board's recommendations, program policy factors, risk reviews, and the amount of funds available in arriving at selections for this FOA.

E. Anticipated Notice of Selection and Award Negotiation Dates

DOE anticipates notifying applicants selected for negotiation of award and negotiating awards by the dates provided on the cover page of this FOA.

VI. Award Administration Information**A. Award Notices****i. Ineligible Submissions**

Ineligible Full Applications will not be further reviewed or considered for award. The Contracting Officer will send a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE eXCHANGE. The notification letter will state the basis upon which the Full Application is ineligible and not considered for further review.

ii. Full Application Notifications

DOE will notify applicants of its determination via a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE eXCHANGE. The notification letter will inform the applicant whether or not its Full Application was selected for award negotiations. Alternatively, DOE may notify one or more applicants that a final selection determination on particular Full Applications will be made at a later date, subject to the availability of funds or other factors.

iii. Applicants Selected for Award Negotiations

DOE may stagger its selection determinations. As a result, some applicants may receive their notification letter in advance of other Applicants. Successful applicants will receive written notification that they have been selected for award negotiations. Receipt of a notification letter selecting a Full Application for award negotiations does not authorize the applicant to commence performance of the project. If an application is selected for award negotiations, it is not a commitment by DOE to issue an award nor is it a guarantee of federal government funding. Applicants do not receive an award unless and until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the prime recipient in FedConnect.

The award negotiation process takes approximately 60 days. Applicants must designate a primary and a backup point-of-contact in EERE eXCHANGE with whom DOE will communicate to conduct award negotiations. The applicant must be responsive during award negotiations (i.e., provide requested documentation) and meet the negotiation deadlines. If the applicant fails to do so or if award negotiations are otherwise unsuccessful, DOE will cancel the award negotiations and rescind the selection. DOE reserves the right to terminate award negotiations at any time for any reason.

Please refer to Section IV.J.ii. of the FOA for guidance on pre-award costs.

iv. Alternate Selection Determinations

In some instances, an applicant may receive a notification that its application was not selected for award and DOE designated the application to be an alternate, which means DOE may consider the Full Application for federal funding in the future. A notification letter stating the Full Application is designated as an alternate does not authorize the applicant to commence performance of the project. DOE may ultimately determine to select or not select the Full Application for award negotiations.

v. Unsuccessful Applicants

DOE shall promptly notify in writing each applicant whose application has not been selected for award or whose application cannot be funded because of the unavailability of appropriated funds.

B. Administrative and National Policy Requirements**i. Registration Requirements**

There are several required one-time actions applicants must take before applying to this FOA. Some of these actions may take several weeks, so it is vital applicants build in enough time to complete them. Failure to complete these actions could interfere with application or negotiation deadlines or the ability to receive an award if selected. These requirements are as follows:

1. EERE Funding Opportunity Exchange (eXCHANGE)

Register and create an account on EERE eXCHANGE at <https://eere-exCHANGE.energy.gov>. This account will allow the user to apply to any open EERE FOAs in EERE eXCHANGE.

To access [EERE eXCHANGE](#), potential applicants must have a [Login.gov](#) account. As part of the eXCHANGE registration process, new users will be directed to create an account in Login.gov. Please note that the email address associated with Login.gov must match the email address associated with the eXCHANGE account. For more information, refer to the eXCHANGE Multi-Factor Authentication (MFA) Quick Guide in the [Manuals section](#) of eXCHANGE.

Each organization or business unit, whether acting as a team or a single entity, should use only one account as the contact point for each submission. Applicants must also designate backup points of contact. **This step is required to apply to this FOA.** The eXCHANGE registration does not have a delay; however, **the remaining registration requirements below could take several weeks to process and are necessary for a potential applicant to receive an award under this FOA.**

2. System for Award Management

Register in SAM (<https://www.sam.gov>). Please update your SAM registration annually.

3. FedConnect

Register in FedConnect (<https://www.fedconnect.net>).

4. Grants.gov

Register in Grants.gov (<http://www.grants.gov>) to receive automatic updates when Amendments to this FOA are posted. Please note that Letters of Intent and Full Applications will **not** be accepted through Grants.gov.

5. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the DOE, including EERE eXCHANGE and FedConnect, constitutes the authorized representative's approval and electronic signature.

ii. Award Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR Part 200 as amended by 2 CFR Part 910.

iii. Foreign National Participation

All applicants selected for an award under this FOA and project participants (including subrecipients and contractors) who anticipate involving foreign nationals in the performance of an award may be required to provide DOE with specific information about each foreign national to satisfy requirements for foreign national participation. A "foreign national" is defined as any person without U.S. citizenship or nationality (may include a stateless person). The volume and type of information collected may depend on various factors associated with the award. DOE concurrence may be required before a foreign national can participate in the performance of any work under an award.

DOE may elect to deny a foreign national's participation in the award. Likewise, DOE may elect to deny a foreign national's access to a DOE site, information, technologies, equipment, programs or personnel.

iv. Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR Part 170. Prime recipients must register with the new FFATA Subaward Reporting System database and report the required data on their first tier subrecipients. Prime recipients must report the executive compensation for their own executives as part of their registration profile in SAM.

v. National Policy Requirements

The National Policy Assurances that are incorporated as a term and condition of award are located at: <http://www.nsf.gov/awards/managing/rtc.jsp>.

vi. Environmental Review in Accordance with National Environmental Policy Act (NEPA)

DOE's decision whether and how to distribute federal funds under this FOA is subject to NEPA (42 U.S.C. § 4321, *et seq.*). NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website at <https://www.energy.gov/nepa>.

While NEPA compliance is a federal agency responsibility and the ultimate decisions remain with the federal agency, all recipients selected for an award will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to their proposed project. If DOE determines certain records must be prepared to complete the NEPA review process (e.g., biological evaluations or environmental assessments), the recipient may be required to prepare the records and the costs to prepare the necessary records may be included as part of the project costs. DOE will independently evaluate the environmental document and will take responsibility for the contents, including ensuring the professional integrity of the discussion and analysis, as required by NEPA.

vii. Flood Resilience

Executive Order 11988, Floodplain Management, requires agencies engage in a decision-making process to evaluate the potential effects of any action it may take in a floodplain and to avoid development in a floodplain to the extent possible. DOE procedures for implementing the Executive Order are in 10 CFR part 1022. Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (reinstated by EO 14030, Climate-Related Financial Risk), directs federal agencies to "expand management from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended." The higher flood elevation is based on one of three approaches: climate-informed science (preferred), freeboard value, or 0.2% annual flood change (500-year floodplain). Selectees will be required to indicate whether the proposed project location(s) is within a floodplain, how the floodplain was defined, and how the project's design has been modified to reduce the risk of

flood loss and minimize the impact of floods on human safety, health, and welfare. Information to assist in the implementation of these requirements is available at:

- <https://www.energy.gov/nepa/articles/eo-13690-establishing-federal-flood-risk-management-standard-and-process-further>
- <https://www.fema.gov/floodplain-management/intergovernmental/white-house-flood-resilience-interagency-working-group>
- <http://floodstandard.climate.gov>

viii. Applicant Representations and Certifications

1. Lobbying Restrictions

By accepting funds under this award, the prime recipient agrees 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 U.S.C. § 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

2. Corporate Felony Conviction and Federal Tax Liability Representations

In submitting an application to this FOA, the applicant represents that:

- a. It is **not** a corporation that has been convicted of a felony criminal violation under any federal law within the preceding 24 months; and
- b. 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, a corporation is any for-profit or nonprofit 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].

3. Nondisclosure and Confidentiality Agreements Representations

In submitting an application to this FOA the applicant represents that:

-
- a. 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.
- b. 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:

“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.”

- (1) The limitation above shall not contravene requirements applicable to Standard Form 312 Classified Information Nondisclosure Agreement (<https://fas.org/sgp/othergov/sf312.pdf>), Form 4414 Sensitive Compartmented Information Disclosure Agreement (<https://fas.org/sgp/othergov/intel/sf4414.pdf>), or any other form issued by a federal department or agency governing the nondisclosure of classified information.
- (2) Notwithstanding the 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 U.S. government, may contain provisions appropriate to the 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 during such activity unless specifically authorized to do so by the U.S. 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 U.S. Department of Justice, that are essential to reporting a substantial violation of law.

ix. Statement of Federal Stewardship

DOE will exercise normal federal stewardship in overseeing the project activities performed under DOE awards. Stewardship activities include but are not limited to conducting site visits; reviewing performance and financial reports; providing assistance and/or temporary intervention in unusual circumstances to correct deficiencies that develop during the project; assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the project objectives have been accomplished.

x. Statement of Substantial Involvement

DOE has substantial involvement in work performed under awards made as a result of this FOA. DOE does not limit its involvement to the administrative requirements of the award. Instead, DOE has substantial involvement in the direction and redirection of the technical aspects of the project. Substantial involvement includes but is not limited to the following:

1. DOE shares responsibility with the recipient for the management, control, direction, and performance of the project.
2. DOE may intervene in the conduct or performance of work under this award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
3. DOE may redirect or discontinue funding the project based on the outcome of DOE's evaluation of the project at the Go/No-Go decision point(s).
4. DOE participates in major project decision-making processes.

xi. Subject Invention Utilization Reporting

To ensure that prime recipients and subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, DOE may require that each prime recipient holding title to a subject invention submit annual reports for 10 years from the date the subject invention was disclosed to DOE on the utilization of the subject invention and efforts made by prime recipient or its licensees or assignees to stimulate such utilization. The

reports must include information regarding the status of development, date of first commercial sale or use, gross royalties received by the prime recipient, and such other data and information as DOE may specify.

xii. Intellectual Property Provisions

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

xiii. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, attached to the award agreement.

Additional reporting requirements apply to BIL-funded projects. DOE may require specific data collection to track progress toward key departmental goals: ensuring justice and equity, investing in quality jobs, boosting domestic manufacturing, reducing greenhouse gas emissions, and advancing a pathway to private sector deployment. Examples of data that may be collected include:

- New manufacturing production or recycling capacity
- Jobs data, including:
 - Number and types of jobs provided, wages and benefits paid
 - Workforce demographics, including local hires
 - Efforts to minimize risks of labor disputes and disruptions
 - Dollar value of contributions to worker training; number of new employee certificates and training credentials; ratio of apprentice- to journey-level workers employed
 - Number of individuals trained, trainees placed in full-time employment, number of trainings partnering with community-based organizations, or labor unions
- Justice and Equity data, including:
 - Underrepresented businesses acting as vendors and subcontractors for bids on supplies, services, and equipment
 - Value, number, and type of partnerships with MSIs
 - Stakeholder engagement events, community engagement process
 - Other relevant indicators from the Community Benefits Plan
- Number and type of energy efficient and clean energy equipment installed
- Funding leveraged, follow-on-funding, intellectual property generation and utilization

xiv. Go/No-Go Review

Each project selected under this FOA will be subject to a periodic project evaluation referred to as a Go/No-Go Review. A Go/No-Go Review is a risk management tool and a project management best practice to ensure that, for the current phase or period of performance, technical success is definitively achieved and potential for success in future phases or periods of performance is evaluated, prior to beginning the execution of future phases. At the Go/No-Go decision points, DOE will evaluate project performance, project schedule adherence, the extent milestone objectives are met, compliance with reporting requirements, and overall contribution to the program goals and objectives. Federal funding beyond the Go/No-Go decision point (continuation funding) is contingent upon (1) availability of federal funds appropriated by Congress for the purpose of this program; (2) the availability of future-year budget authority; (3) recipient's technical progress compared to the Milestone Summary Table stated in Attachment 1 of the award; (4) recipient's submittal of required reports; (5) recipient's compliance with the terms and conditions of the award; (6) DOE's Go/No-Go decision; (7) the recipient's submission of a continuation application;⁴⁴ and (8) written approval of the continuation application by the Contracting Officer.

As a result of the Go/No-Go Review, DOE may, at its discretion, authorize the following actions: (1) continue to fund the project, contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority; (2) recommend redirection of work under the project; (3) place a hold on federal funding for the project, pending further supporting data or funding; or (4) discontinue funding the project because of insufficient progress, change in strategic direction, or lack of funding.

The Go/No-Go decision is distinct from a non-compliance determination. In the event a recipient fails to comply with the requirements of an award, DOE may take appropriate action, including but not limited to, redirecting, suspending or terminating the award.

⁴⁴ A continuation application is a non-competitive application for an additional budget period within a previously approved project period. At least ninety (90) days before the end of each budget period, the recipient must submit its continuation application, which includes the following information:

- i. A progress report on the project objectives, including significant findings, conclusions, or developments, and an estimate of any unobligated balances remaining at the end of the budget period. If the remaining unobligated balance is estimated to exceed 20 percent of the funds available for the budget period, explain why the excess funds have not been obligated and how they will be used in the next budget period.
- ii. A detailed budget and supporting justification if there are changes to the negotiated budget, or a budget for the upcoming budget period was not approved at the time of award.
- iii. A description of any planned changes from the SOPO and/or Milestone Summary Table.

xv. Conference Spending

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the U.S. government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the U.S. 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.

xvi. Uniform Commercial Code (UCC) Financing Statements

Per 2 CFR 910.360 (Real Property and Equipment) when a piece of equipment is purchased by a for-profit recipient or subrecipient with federal funds, and when the federal share of the financial assistance agreement is more than \$1 million the recipient or subrecipient must:

Properly record, and consent to the Department's ability to properly record if the recipient fails to do so, UCC financing statement(s) for all equipment in excess of \$5,000 purchased with project funds. These financing statement(s) must be approved in writing by the Contracting Officer prior to the recording, and they shall provide notice that the recipient's title to all equipment (not real property) purchased with federal funds under the financial assistance agreement is conditional pursuant to the terms of this section, and that the government retains an undivided reversionary interest in the equipment. The UCC financing statement(s) must be filed before the Contracting Officer may reimburse the recipient for the federal share of the equipment unless otherwise provided for in the relevant financial assistance agreement. The recipient shall further make any amendments to the financing statements or additional recordings, including appropriate continuation statements, as necessary or as the Contracting Officer may direct.

xvii. Real Property and Equipment

Real property and equipment purchased with project funds (federal share and recipient cost share) are subject to the requirements at 2 CFR 200.310, 200.311, 200.313, and 200.316 (non-federal entities, except for-profit entities) and 2 CFR 910.360 (for-profit entities). For projects selected for awards under this FOA, the recipients may (1) take disposition action on the real property and equipment; or (2) continue to use the real property and equipment after the conclusion of the

award period of performance with Contracting Officer approval. The recipient's written request for Continued Use must identify the property and include: a summary of how the property will be used (must align with the authorized project purposes); a proposed use period, (e.g., perpetuity, until fully depreciated, or a calendar date when the recipient expects to submit disposition instructions); acknowledgement that the recipient shall not sell or encumber the property or permit any encumbrance without prior written DOE approval; current fair market value of the property; and an estimated useful life or depreciation schedule for equipment.

When the property is no longer needed for authorized project purposes, the recipient must request disposition instructions from DOE. For-profit entity disposition requirements are set forth in 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR 200.310 – 200.316.

xviii. Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty

States, local governments, and other public entities may not condition subawards in a manner that would discriminate against or otherwise disadvantage subrecipients based on their religious character.

xix. Participants and Collaborating Organizations

If selected for award negotiations, the selected applicant must submit a list of personnel who are proposed to work on the project, both at the recipient and subrecipient level and a list of proposed collaborating organizations prior to award. Recipients will have an ongoing responsibility to notify DOE of changes to the personnel and collaborating organizations and submit updated information during the life of the award.

xx. Current and Pending Support

If selected for award negotiations, within 30 days of the selection notice the selectee must submit: 1) current and pending support disclosures and resumes for any new PIs or senior/key personnel, and 2) updated disclosures if there have been any changes to the current and pending support submitted with the application. Throughout the life of the award, the recipient has an ongoing responsibility to submit: 1) current and pending support disclosure statements and resumes for any new PI and senior/key personnel, and 2) updated disclosures if there are changes to the current and pending support previously submitted to DOE. Also see Section IV.D.xvii.

xxi. U.S. Manufacturing Commitments

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 United States industry and labor. Therefore, in exchange for receiving taxpayer dollars to support an applicant's project, the applicant/recipient and any subrecipient contractor 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 specific U.S. Competitiveness Provision applicable to the various types of recipients and projects, 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 to practice 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 United States manufacturing plan. The statement or plan would contain specific and enforceable commitments that would be beneficial to the United States economy and competitiveness. Examples of such commitments could include manufacturing specific products in the United States, making a specific investment in a new or existing United States manufacturing facility, keeping certain activities based in the United States or supporting a certain number of jobs in the United States related to the technology. DOE may, in its sole discretion, determine that the proposed modification or waiver promotes commercialization and provides substantial United States 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 at

<https://www.energy.gov/management/pf-2022-09-fal-2022-01-implementation-doe-determination-exceptional-circumstances-under>. 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.J. Title to Subject Inventions of this FOA for more information on the DEC and DOE Patent Waivers.

xxii. Interim Conflict of Interest Policy for Financial Assistance

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy)⁴⁵ is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., a grant, cooperative agreement, or 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. The term "Investigator" means the PI and any other person, regardless of title or position, who is responsible for the purpose, design, conduct, or reporting of a project funded by DOE or proposed for funding by DOE. Recipients must flow down the requirements of the interim COI Policy to any subrecipient non-federal entities. Further, for DOE funded projects, the recipient must include all financial conflicts of interest (FCOI) (i.e., managed and unmanaged/unmanageable) in its initial and ongoing FCOI reports.

It is understood that non-federal entities and individuals receiving DOE financial assistance awards will need sufficient time to come into full compliance with DOE's interim COI Policy. To provide some flexibility, DOE allows for a staggered implementation. Specifically, prior to award, applicants selected for award negotiations must: ensure all Investigators complete their significant financial disclosures; review the disclosures; determine whether a FCOI exists; develop and implement a management plan for FCOIs; and provide DOE with an initial FCOI report that includes all FCOIs (i.e., managed and unmanaged/unmanageable). Recipients will have 180 days from the date of the award to come into full compliance with the other requirements set forth in DOE's interim COI Policy. Prior to award, the applicant must certify that it is, or will be within 180 days of the award, compliant with all requirements in the COI Policy.

⁴⁵ DOE's interim COI Policy can be found at [PF 2022-17 FAL 2022-02 Department of Energy Interim Conflict of Interest Policy Requirements for Financial Assistance](#).

xxiii. Data Management Plan

Each applicant whose Full Application is selected for award negotiations will be required to submit a Data Management Plan (DMP) during the award negotiations phase. A DMP explains how, when appropriate, data generated in the course of the work performed under a DOE award will be shared and preserved to validate the results of the proposed work or how the results could be validated if the data is not shared or preserved. The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publications.

xxiv. Fraud, Waste, and Abuse

The mission of the DOE Office of Inspector General (OIG) is to strengthen the integrity, economy, and efficiency of the Department's programs and operations, including deterring and detecting fraud, waste, abuse, and mismanagement. The OIG accomplishes this mission primarily through investigations, audits, and inspections of DOE activities to include grants, cooperative agreements, loans, and contracts.

The OIG maintains a hotline for reporting allegations of fraud, waste, abuse, or mismanagement. To report such allegations, please visit <https://www.energy.gov/ig/ig-hotline>.

Additionally, recipients of DOE awards must be cognizant of the requirements of [2 CFR 200.113 Mandatory disclosures](#), which states:

The non-Federal entity or applicant for a Federal award must disclose, in a timely manner, in writing to the Federal awarding agency or pass-through entity all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Non-Federal entities that have received a Federal award including the term and condition outlined in appendix XII of 2 CFR Part 200 are required to report certain civil, criminal, or administrative proceedings to SAM.gov. Failure to make required disclosures can result in any of the remedies described in [2 CFR 200.339](#). (See also [2 CFR part 180](#), [31 U.S.C. § 3321](#), and [41 U.S.C. § 2313](#).) [[85 FR 49539](#), Aug. 13, 2020]

Applicants and subrecipients (if applicable) are encouraged to allocate sufficient costs in the project budget to cover the costs associated for personnel and data infrastructure needs to support performance management and program evaluation needs, including but not limited to

independent program and project audits to mitigate risks for fraud, waste, and abuse.

xxv. Human Subjects Research

Research involving human subjects, biospecimens, or identifiable private information conducted with DOE funding is subject to the requirements of DOE Order 443.1C, Protection of Human Research Subjects, 45 CFR Part 46, Protection of Human Subjects (subpart A which is referred to as the “Common Rule”), and 10 CFR Part 745, Protection of Human Subjects. Additional information on the DOE Human Subjects Research Program can be found at: [HUMAN SUBJECTS Human Subjects Pr... | U.S. DOE Office of Science \(SC\) \(osti.gov\)](#).

xxvi. Cybersecurity Plan

In accordance with BIL section 40126, applicants selected for award negotiations must submit a cybersecurity plan to DOE prior to receiving funding.⁴⁶ These plans are intended to foster a cybersecurity-by-design approach for BIL efforts. The Department will use these plans to ensure effective integration and coordination across its research, development, and demonstration programs. A cybersecurity plan is **not** required as part of the application submission for this FOA, but all projects selected under this FOA will be required to submit a cybersecurity plan during the award negotiation phase.

DOE recommends using open guidance and standards, such as the National Institute of Standards and Technology’s (NIST) Cybersecurity Framework (CSF) and the DOE Cybersecurity Capability Maturity Model (C2M2).⁴⁷ The cybersecurity plan created pursuant to BIL section 40126 should document any deviation from open standards, as well as the utilization of proprietary standards where the awardee determines that such deviation is necessary.

⁴⁶ 42 U.S.C. § 18725

⁴⁷ NERC critical infrastructure protection (CIP) standards for entities responsible for the availability and reliability of the bulk electric system. NIST IR 7628: 2 Smart grid cyber security strategy and requirements. NIST SP800-53, Recommended Security Controls for Federal Information Systems and Organizations: Catalog of security controls in 18 categories, along with profiles for low-, moderate-, and high-impact systems. NIST SP800-82, Guide to Industrial Control Systems (ICS) Security. NIST SP800-39, Integrated Enterprise-Wide Risk Management: Organization, mission, and information system view. AMI System Security Requirements: Security requirements for advanced metering infrastructure. ISO (International Organization for Standardization) 27001, Information Security Management Systems: Guidance on establishing governance and control over security activities (this document must be purchased). IEEE (Institute of Electrical and Electronics Engineers) 1686-2007, Standard for Substation Intelligent Electronic Devices (IEDs) Cyber Security Capabilities (this document must be purchased). DOE Cybersecurity Capability Maturity Model (C2M2).

- Cybersecurity plans should be commensurate to the threats and vulnerabilities associated with the proposed efforts and demonstrate the cybersecurity maturity of the project.
- Cybersecurity plans may cover a range of topics relevant to the proposed project—e.g., software development lifecycle, third-party risks, and incident reporting.
- At a minimum, cybersecurity plans should address questions noted in BIL section 40126 (b), Contents of Cybersecurity Plan.⁴⁸

Supplementary guidance on the cybersecurity plan requirement is available at <https://www.energy.gov/ceser/bipartisan-infrastructure-law-implementation>.

VII. Questions/Agency Contacts

Upon the issuance of a FOA, DOE personnel are prohibited from communicating (in writing or otherwise) with applicants regarding the FOA except through the established question and answer process described below. Questions regarding this FOA must be submitted to BIL_EGSPilotDemos@ee.doe.gov no later than three (3) business days prior to the application due date and time. Please note, feedback on individual concepts will not be provided through Q&A.

All questions and answers related to this FOA will be posted on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov>. **You must first select the FOA Number to view the questions and answers specific to this FOA.** EERE will attempt to respond to a question within three (3) business days unless a similar question and answer has already been posted on the website.

Questions related to the registration process and use of the EERE eXCHANGE website should be submitted to EERE-eXCHANGESupport@hq.doe.gov.

VIII. Other Information

A. FOA Modifications

Amendments to this FOA will be posted on EERE eXCHANGE and the Grants.gov system. However, you will only receive an email when an amendment or a FOA is posted on these sites if you register for email notifications for this FOA in Grants.gov. EERE recommends that you register as soon after the release of the

⁴⁸ 42 U.S.C. § 18725

FOA as possible to ensure you receive timely notice of any amendments or other FOAs.

B. 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.

C. Commitment of Public Funds

The Contracting Officer is the only individual who can make awards or commit the government to the expenditure of public funds. A commitment by anyone other than the Contracting Officer, either express or implied, is invalid.

D. Treatment of Application Information

Applicants should not include trade secrets or business-sensitive, proprietary, or otherwise confidential information in their application unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the FOA. Applicants are advised to not include any critically sensitive proprietary detail.

If an application includes trade secrets or business-sensitive, proprietary, or otherwise confidential information, it is furnished to the federal government in confidence with the understanding that the information shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the application or as otherwise authorized by law. This restriction does not limit the federal government's right to use the information if it is obtained from another source.

If an applicant chooses to submit trade secrets or business-sensitive, proprietary, or otherwise confidential information, the applicant must provide **two copies** of the submission (e.g., Full Application). The first copy should be marked "non-confidential," with the information believed to be confidential deleted. The second copy should be marked "confidential" and must clearly and conspicuously identify the trade secrets or business-sensitive, proprietary, or otherwise confidential information and must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The federal government is not liable for the disclosure or use of

unmarked information and may use or disclose such information for any purpose as authorized by law.

The cover sheet of the Full Application, and other applicant submission must be marked as follows and identify the specific pages containing trade secrets or business-sensitive, proprietary, or otherwise confidential information:

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain trade secrets or business-sensitive, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance agreement between the submitter and the government. The government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

In addition, (1) the header and footer of every page that contains trade secrets or business-sensitive, proprietary, or otherwise confidential information must be marked as follows: “Contains Business Sensitive Information, Trade Secrets, or Proprietary or Otherwise Confidential Information Exempt from Public Disclosure,” and (2) every line or paragraph containing such information must be clearly marked with double brackets or highlighting. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

E. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Go/No-Go Reviews and Peer Reviews, 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, including DOE contractors. The applicant, by submitting its application, consents to the use of non-federal reviewers/administrators. Non-federal reviewers must sign conflict of interest (COI) and non-disclosure acknowledgements (NDA) prior to reviewing an application. Non-federal personnel conducting administrative activities must sign an NDA.

F. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this FOA include those that 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.

G. Notice of Right to Conduct a Review of Financial Capability

DOE reserves the right to conduct an independent third-party review of financial capability for applicants that are selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

H. Requirement for Full and Complete Disclosure

Applicants are required to make a full and complete disclosure of all information requested. Any failure to make a full and complete disclosure of the requested information may result in:

- The cancellation of award negotiations;
- The modification, suspension, and/or cancellation of a funding agreement;
- The initiation of debarment proceedings, debarment, and/or a declaration of ineligibility for receipt of federal contracts, subcontracts, and financial assistance and benefits; and
- Civil and/or criminal penalties.

I. Retention of Submissions

DOE expects to retain copies of all Full Applications and other submissions. No submissions will be returned. By applying to DOE for funding, applicants consent to DOE's retention of their submissions.

J. Title to Subject Inventions

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

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions;
- 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 has issued a class waiver that applies to this FOA. Under this class waiver, domestic large businesses may elect title to their subject inventions similar to

the right provided to the domestic small businesses, educational institutions, and nonprofits by law. To avail itself of the class waiver, a domestic large business must 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.

- **Advance and Identified Waivers:** Applicants not covered by a Class Patent Waiver or the Bayh-Dole Act may request a patent waiver that will cover subject inventions that may be invented under the award, in advance of or within 30 days after the effective date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to DOE within the timeframes set forth in the award's intellectual property data terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.
- **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 subawards, under this FOA shall include the U.S. Competitiveness Provision in accordance with Section VI.B.xx. U.S. Manufacturing Commitments 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 further DEC's on the website above prior to the issuance of awards under this FOA. DOE may require additional submissions or requirements as authorized by any applicable DEC.

K. Government Rights in Subject Inventions

Where prime recipients, subrecipients, and contractors retain title to subject inventions, the U.S. government retains certain rights.

Government Use License

The U.S. government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any

subject invention throughout the world. This license extends to government contractors.

March-In Rights

The U.S. government retains march-in rights with respect to all subject inventions. Through “march-in rights,” the government may require a prime recipient or subrecipient who has elected to retain title to a subject invention (or their assignees or exclusive licensees), to grant a license for use of the invention to a third party. In addition, the government may grant licenses for use of the subject invention when a prime recipient, subrecipient, or their assignees and exclusive licensees refuse to do so.

DOE may exercise its march-in rights only if it determines that such action is necessary under any of the four following conditions:

- The owner or licensee has not taken or is not expected to take effective steps to achieve practical application of the invention within a reasonable time;
- The owner or licensee has not taken action to alleviate health or safety needs in a reasonably satisfied manner;
- The owner has not met public use requirements specified by federal statutes in a reasonably satisfied manner; or
- The United States manufacturing requirement has not been met.

Any determination that march-in rights are warranted must follow a fact-finding process in which the recipient has certain rights to present evidence and witnesses, confront witnesses and appear with counsel and appeal any adverse decision. To date, DOE has never exercised its march-in rights to any subject inventions.

L. 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 retains unlimited rights in technical data produced under

government financial assistance awards, including the right to distribute to the public. One exception to the foregoing is that invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

M. Copyright

The prime recipient and subrecipients may assert copyright in copyrightable works, such as software, first produced under the award without DOE approval. When copyright is asserted, the government retains a paid-up nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public, and to perform publicly and display publicly the copyrighted work. This license extends to contractors and others doing work on behalf of the government.

N. Export Control

The United States government regulates the transfer of information, commodities, technology, and software considered to be strategically important to the United States to protect national security, foreign policy, and economic interests without imposing undue regulatory burdens on legitimate international trade. There is a network of federal agencies and regulations that govern exports that are collectively referred to as "Export Controls." All recipients and subrecipients are responsible for ensuring compliance with all applicable United States Export Control laws and regulations relating to any work performed under a resulting award.

The recipient must immediately report to DOE any export control investigations, indictments, charges, convictions, and violations upon occurrence, at the recipient or subrecipient level, and provide the corrective action(s) to prevent future violations.

O. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

As set forth in 2 CFR 200.216, recipients and subrecipients are prohibited from obligating or expending project funds (federal funds and recipient cost share) to procure or obtain; extend or renew a contract to procure or obtain; exercise an option to procure, or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use *covered telecommunications equipment or services* as a substantial or essential component of any system, or as critical technology as part of any system. As described in Section 889 of Public Law 115-232, covered telecommunications

equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

See Public Law 115-232, Section 889, 2 CFR 200.216, and 2 CFR 200.471 for additional information.

P. Personally Identifiable Information (PII)

All information provided by the applicant must to the greatest extent possible exclude PII. "PII" refers to information that can be used to distinguish or trace an individual's identity, such as their name, Social Security number, or biometric records, alone or combined with other personal or identifying information linked or linkable to a specific individual, such as date and place of birth or mother's maiden name. (See OMB Memorandum M-17-12 dated January 3, 2017.)

By way of example, applicants must screen resumes to ensure that they do not contain PII such as personal addresses, personal landline/cell phone numbers, and personal emails. **Under no circumstances should Social Security numbers (SSNs) be included in the application.** Federal agencies are prohibited from the collecting, using, and displaying unnecessary SSNs. (See the Federal Information Security Modernization Act of 2014 (Pub. L. No. 113-283, Dec 18, 2014; 44 U.S.C. § 3551).

Q. Annual Independent Audits

If a for-profit entity is a prime recipient and has expended \$750,000 or more of DOE awards during the entity's fiscal year, an annual compliance audit performed by an independent auditor is required. For additional information, please refer to 2 CFR 910.501 and Subpart F.

If an educational institution, nonprofit organization, or state/local government is a prime recipient or subrecipient and has expended \$750,000 or more of federal awards during the non-federal entity's fiscal year, a Single or Program-Specific Audit is required. For additional information, please refer to 2 CFR 200.501 and Subpart F.

Applicants and subrecipients (if applicable) should propose sufficient costs in the project budget to cover the costs associated with the audit. DOE will share in the cost of the audit at its applicable cost share ratio.

R. Informational Webinar

DOE will conduct one informational webinar during the FOA process, scheduled for **June 26th, 2024 at 1:00pm ET**. This information, and the link to the informational webinar, will be posted on EERE eXCHANGE.

Attendance is not mandatory and will not positively or negatively impact the overall review of any applicant submissions. The webinar will be open to all applicants who wish to participate. Applicants should refrain from asking questions or communicating information that would reveal confidential and/or proprietary information specific to their project. The webinar date and time are listed on the cover page of the FOA.

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms “cost sharing” and “cost matching” are often used synonymously. Even the DOE Financial Assistance Regulations, 2 CFR 200.306, use both terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses “cost sharing,” as it conveys the concept that non-federal share is calculated as a percentage of the Total Project Cost. An exception is the State Energy Program Regulation, 10 CFR 420.12, State Matching Contribution. Here “cost matching” for the non-federal share is calculated as a percentage of the federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. FFRDC costs must be included in Total Project Costs. The following is an example of how to calculate cost sharing amounts for a project with \$1 million in federal funds with a minimum 20% non-federal cost sharing requirement:

- Formula: Federal share (\$) divided by federal share (%) = Total Project Cost
Example: \$1,000,000 divided by 80% = \$1,250,000
- Formula: Total Project Cost (\$) minus federal share (\$) = Non-federal share (\$)
Example: \$1,250,000 minus \$1,000,000 = \$250,000
- Formula: Non-federal share (\$) divided by Total Project Cost (\$) = Non-federal share (%)
Example: \$250,000 divided by \$1,250,000 = 20%

What Qualifies for Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or two sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the federal government under another award unless authorized by federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though they are generally the same for all types of entities. The specific rules applicable to:

*Questions about this FOA? BIL_EGSPilotDemos@ee.doe.gov
Problems with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.*

- FAR Part 31 for For-Profit entities, (48 CFR Part 31); and
- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

In addition to the above regulations, other factors may come into play, such as timing of donations and length of the project period. For example, the value of 10 years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, DOE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official.

General Cost Sharing Rules on a DOE Award

- 1. Cash Cost Share** encompasses all contributions to the project made by the recipient or subrecipient(s) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, or equipment for their company with organizational resources. If the cost of the item or service is reimbursed, it is cash cost share. All cost share items must be necessary to the performance of the project.
- 2. In-Kind Cost Share** encompasses all contributions to the project made by the recipient or subrecipient(s) that do not involve a payment or reimbursement and represent donated items or services. In-Kind cost share items include volunteer personnel hours, donated existing equipment, and donated existing supplies. The cash value and calculations thereof for all In-Kind cost share items must be justified and explained in the Cost Share section of the project Budget Justification. All cost share items must be necessary to the performance of the project. Consult your DOE contact if you have questions before filling out the In-Kind cost share section of the Budget Justification.
- 3. Funds from other federal sources** may **not** be counted as cost share. This prohibition includes FFRDC subrecipients. Non-federal sources include any source not originally derived from federal funds. Cost sharing commitment letters from subrecipients must be provided with the original application.
- 4. Fee or profit**, including foregone fee or profit, are not allowable as project costs (including cost share) under any resulting award. The project may incur only those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

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DOE Financial Assistance Rules 2 CFR Part 200 as amended by 2 CFR Part 910

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

- (A) Acceptable contributions.** All contributions, including cash contributions and third-party in-kind contributions, must be accepted as part of the prime recipient's cost sharing if such contributions meet all of the following criteria:
- (1)** They are verifiable from the recipient's records.
 - (2)** They are not included as contributions for any other federally assisted project or program.
 - (3)** They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.
 - (4)** They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:
 - a.** For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A-122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the FAR, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. FAR Subpart 31.2—Contracts with Commercial Organizations; and
 - b.** Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.
 - (5)** They are not paid by the federal government under another award unless authorized by federal statute to be used for cost sharing or matching.
 - (6)** They are provided for in the approved budget.
- (B) Valuing and documenting contributions**
- (1)** Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or

equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:

- a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
 - b. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.
- (2)** Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.
- (3)** Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.
- (4)** Valuing property donated by third parties.
 - a. Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.
 - b. Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are

applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

- i. The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately owned building in the same locality.
- ii. The value of loaned equipment must not exceed its fair rental value.

(5) Documentation. The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

- a. Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.
- b. The basis for determining the valuation for personal services and property must be documented.

APPENDIX B – SAMPLE COST SHARE CALCULATION FOR BLENDED COST SHARE PERCENTAGE

The following example shows the math for calculating required cost share for a project with \$2 million in federal funds, with four tasks requiring different non-federal cost share percentages:

Task	Proposed Federal Share	Federal Share %	Recipient Share %
Task 1 (R&D)	\$1,000,000	80%	20%
Task 2 (R&D)	\$500,000	80%	20%
Task 3 (Demonstration)	\$400,000	50%	50%
Task 4 (Outreach)	\$100,000	100%	0%

Federal share (\$) divided by federal share (%) = Task Cost

Each task must be calculated individually as follows:

Task 1

\$1,000,000 divided by 80% = \$1,250,000 (Task 1 Cost)

Task 1 Cost minus federal share = non-federal share

\$1,250,000 - \$1,000,000 = \$250,000 (non-federal share)

Task 2

\$500,000 divided 80% = \$625,000 (Task 2 Cost)

Task 2 Cost minus federal share = non-federal share

\$625,000 - \$500,000 = \$125,000 (non-federal share)

Task 3

\$400,000 / 50% = \$800,000 (Task 3 Cost)

Task 3 Cost minus federal share = non-federal share

\$800,000 - \$400,000 = \$400,000 (non-federal share)

Task 4

Federal share = \$100,000

Non-federal cost share is not mandated for outreach = \$0 (non-federal share)

The calculation may then be completed as follows:

Tasks	\$ Federal Share	% Federal Share	\$ Non-Federal Share	% Non-Federal Share	Total Project Cost
Task 1	\$1,000,000	80%	\$250,000	20%	\$1,250,000
Task 2	\$500,000	80%	\$125,000	20%	\$625,000
Task 3	\$400,000	50%	\$400,000	50%	\$800,000
Task 4	\$100,000	100%	\$0	0%	\$100,000
Totals	\$2,000,000		\$775,000		\$2,775,000

Blended Cost Share %

Non-federal share (\$775,000) divided by Total Project Cost (\$2,775,000) = 27.9% (non-federal)

Federal share (\$2,000,000) divided by Total Project Cost (\$2,775,000) = 72.1% (federal)

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APPENDIX C – WAIVER REQUESTS FOR: 1. FOREIGN ENTITY PARTICIPATION; AND 2. FOREIGN WORK

1. Waiver for Foreign Entity Participation

Many of the technology areas DOE funds fall in the category of critical and emerging technologies (CETs). CETs are a subset of advanced technologies that are potentially significant to United States national and economic security.⁴⁹ For projects selected under this FOA, all recipients and subrecipients must be organized, chartered or incorporated (or otherwise formed) under the laws of a state or territory of the United States; have majority domestic ownership and control; and have a physical location for business operations in the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Waiver Criteria

Foreign entities seeking to participate in a project funded under this FOA must demonstrate to the satisfaction of DOE that:

- a. Its participation is in the best interest of the United States industry and United States economic development;
- b. The project team has appropriate measures in place to control sensitive information and protect against unauthorized transfer of scientific and technical information;
- c. Adequate protocols exist between the United States subsidiary and its foreign parent organization to comply with export control laws and any obligations to protect proprietary information from the foreign parent organization;
- d. The work is conducted within the United States and the entity acknowledges and demonstrates that it has the intent and ability to comply with the United States Competitiveness Provision (see Section VI.B.xxi.); and
- e. The foreign entity will satisfy other conditions that may be deemed necessary by DOE to protect United States government interests.

Content for Waiver Request

A Foreign Entity waiver request must include the following:

- a. Information about the entity: name, point of contact, and proposed type of involvement in the project;
- b. Country of incorporation, the extent of the ownership/level control by foreign entities, whether the entity is state owned or controlled, a summary of the

⁴⁹ See [Critical and Emerging Technologies List Update \(whitehouse.gov\)](https://www.whitehouse.gov).

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- ownership breakdown of the foreign entity, and the percentage of ownership/control by foreign entities, foreign shareholders, foreign state, or foreign individuals;
- c. The rationale for proposing a foreign entity participate (must address criteria above);
 - d. A description of the project's anticipated contributions to the United States economy;
 - How the project will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
 - How the project will promote manufacturing of products and/or services in the United States;
 - e. A description of how the foreign entity's participation is essential to the project;
 - f. A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP; and
 - g. Countries where the work will be performed. (Note: if any work is proposed to be conducted outside the United States, the applicant must also complete a separate request foreign work waiver.)

DOE may also require:

- A risk assessment with respect to IP and data protection protocols that includes the export control risk based on the data protection protocols, the technology being developed, and the foreign entity and country. These submissions could be prepared by the project lead (if not the prime recipient), but the prime recipient must make a representation to DOE as to whether it believes the data protection protocols are adequate and make a representation of the risk assessment – high, medium, or low risk of data leakage to a foreign entity.
- Additional language be added to any agreement or subagreement to protect IP, mitigate risk, or other related purposes.

DOE may require additional information before considering the waiver request.

DOE's decision concerning a waiver request is not appealable.

2. Waiver for Performance of Work in the United States (Foreign Work Waiver)

As set forth in Section IV.J.iii., all work funded under this FOA must be performed in the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit an explicit waiver request in the Full

Application. A separate waiver request must be submitted for each entity proposing performance of work outside of the United States.

Overall, a waiver request must demonstrate to the satisfaction of DOE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to perform work outside of the United States. A request for a foreign work waiver must include the following:

1. The rationale for performing the work outside the United States (“foreign work”);
2. A description of the work proposed to be performed outside the United States;
3. An explanation as to how the foreign work is essential to the project;
4. A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the U.S. economy;
5. The associated benefits to be realized and the contribution to the project from the foreign work;
6. How the foreign work will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
7. How the foreign work will promote manufacturing of products and/or services in the United States;
8. A description of the likelihood of IP being created from the foreign work and the treatment of any such IP;
9. The total estimated cost (DOE and recipient cost share) of the proposed foreign work;
10. The countries in which the foreign work is proposed to be performed; and
11. The name of the entity that would perform the foreign work.

DOE may require additional information before considering the waiver request.

DOE’s decision concerning a waiver request is not appealable.

APPENDIX D – REQUIRED USE OF AMERICAN IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS BUY AMERICA REQUIREMENTS FOR INFRASTRUCTURE PROJECTS

A. Definitions

For purposes of the Buy America Requirement, the following definitions apply:

Components See 2 CFR 184.3 Definitions

Construction Materials See 2 CFR 184.3 Definitions

“Buy America Preference,” “Buy America Requirement,” or “domestic content procurement preference” means the requirements set forth in section 70914 of the Build America, Buy America Act, which requires the head of each Federal agency to ensure that none of the funds subject to the requirements are made available for a Federal award for an infrastructure project may be obligated unless all of the iron, steel, manufactured products, and construction materials incorporated into the project are produced in the United States.

Infrastructure See 2 CFR 184.4(c) and (d).

Manufactured Products See 2 CFR 184.3 Definitions

Predominantly of iron or steel See 2 CFR 184.3 Definitions.

Infrastructure project See 2 CFR 184.3 Definitions

B. Buy America Requirement for Infrastructure Projects (Buy America Requirement)

None of the award funds (includes federal share and recipient cost share) may be used for a project for infrastructure unless:

(1) all iron and steel used in the project is produced in the United States—this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;

(2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been

established under applicable law or regulation. See 2 CFR 184.5 for determining the cost of components for manufactured products; and

(3) all construction materials⁵⁰ are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. See 2 CFR 184.6 for construction material standards.

The Buy America Requirement only applies to those articles, materials, and supplies that are consumed in, incorporated into, or affixed to the infrastructure in the project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does the Buy America Requirement apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

The Buy America Requirement only applies to an article, material, or supply classified into one of the following categories* based on its status at the time it is brought to the work site for incorporation into an infrastructure project:

- (i) Iron or steel products;
- (ii) Manufactured products; or
- (iii) Construction materials;

The Buy America Requirement only applies to the iron or steel products, manufactured products, and construction materials used for the construction, alteration, maintenance, or repair of public infrastructure in the United States when those items are consumed in, incorporated into, or permanently affixed to the infrastructure. An article, material, or supply incorporated into an infrastructure project should not be considered to fall into multiple categories, but rather must meet the Buy America Preference Requirement for only the single category in which it is classified.

The Buy America Requirement applies to public infrastructure projects in the United States. For purposes of this guidance, applicants should consider whether the infrastructure project will serve a public function. Infrastructure projects should generally be considered “public” if the infrastructure is: publicly owned, privately owned but operated on behalf of the public, or is a place of public accommodation. Review the implementation guidance in OMB Memorandum [OMB Memorandum M-24-02](#) and consult with DOE if you are unsure if your project is subject to Buy America requirements.

⁵⁰ Excludes cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

All iron and steel, manufactured products, and construction materials used in the infrastructure project must be produced in the United States.

* *Section 70917(c) Materials* are cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives as provided in section 70917(c) of BABA. Section 70917 (c) materials are excluded from Construction materials. Asphalt concrete pavement mixes are typically composed of asphalt cement (a binding agent) and aggregates such as stone, sand, and gravel. Accordingly, asphalt is also excluded from the definition of Construction materials.

Section 70917(c) materials, on their own, are not manufactured products. Further, Section 70917(c) materials should not be considered manufactured products when they are used at or combined proximate to the work site—such as is the case with wet concrete or hot mix asphalt brought to the work site for incorporation. However, certain Section 70917(c) materials (such as stone, sand, and gravel) may be used to produce a manufactured product, such as is precast concrete. Precast concrete is made of components, is processed into a specific shape or form, and is in such state when brought to the work site. Furthermore, wet concrete should not be considered a manufactured product if not dried or set prior to reaching the work site.

Further clarification is provided in 2 CFR Part 184 on the circumstances under which a determination is made that Section 70917(c) materials should be treated as components of a manufactured product. That determination is based on consideration of: (i) the revised definition of the “manufactured products” at 2 CFR 184.3; (ii) a new definition of “section 70917(c) materials” at 2 CFR 184.3; (iii) new instructions at 2 CFR 184.4(e) on how and when to categorize articles, materials, and supplies; and (iv) new instructions at 2 CFR 184.4(f) on how to apply the Buy America preference by category.

The Prime Recipient is responsible for flowing the Buy America Requirement down to all subawards, contracts, subcontracts, and purchase orders for work performed under the proposed infrastructure project, including to For-Profit Entities when the For-Profit Entity is a subrecipient or subawardee.

Recipients must certify or provide equivalent documentation for proof of compliance that a good faith effort was made to solicit bids for domestic products used in the infrastructure project under this award.

Recipients must also maintain certifications or equivalent documentation for proof of compliance that those articles, materials, and supplies that are consumed in, incorporated into, affixed to, or otherwise used in the infrastructure project, not covered by an approved waiver or an exemption provided in 2 CFR 184.8, are produced in the United States. The certification or proof of compliance must be provided by the suppliers or manufacturers of the iron, steel,

manufactured products and construction materials and flow up from all subawardees, contractors and vendors to the recipient. Recipients must keep these certifications with the award/project files and be able to produce them upon request from DOE, auditors or Office of Inspector General.

C. DOE Submission Requirements for Full Application

Within the first two pages of the workplan or project description, applicants must provide a short statement on whether the project will involve the construction, alteration, maintenance and/or repair of infrastructure in the United States. The ultimate determination about whether a project includes infrastructure remains with DOE, but the applicant's statement will assist project planning and integration of the Buy America Requirement, which may impact the project's proposed budget and/or schedule.

D. Waivers

In limited circumstances, DOE may waive the application of the Buy America Requirement in an award where DOE determines that:

- (1) applying the Buy America requirements would be inconsistent with the public interest (Public Interest);
- (2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (Non-Availability); or
- (3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (Unreasonable Cost).

DOE will only process waiver requests after an award has been made but prior to any purchase of items the recipient is seeking to waive, and for which the requests have been submitted in accordance with the term and conditions of the award. Waiver requests must be reviewed by DOE and the Office of Management and Budget's Made in America Office and are subject to a public comment period of no less than 15 calendar days.

DOE or OMB may request additional information for consideration of the waiver. DOE may reject or grant waivers in whole or in part depending on its review, analysis, and/or feedback from OMB or the public. DOE's final determination regarding approval or rejection of the waiver request may not be appealed by a recipient.

Requests to waive the Buy America Requirement must include the following:

- Waiver type (Public Interest, Non-Availability, or Unreasonable Cost);

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- Recipient name and Unique Entity Identifier (UEI);
 - Award information (Federal Award Identification Number, Assistance Listing number);
 - A brief description of the project, its location, and the specific infrastructure involved;
 - Total estimated project cost, with estimated federal share and recipient cost share breakdowns;
 - Total estimated infrastructure costs, with estimated federal share and recipient cost share breakdowns;
 - List and description of iron or steel item(s), manufactured goods, and/or construction material(s) the recipient seeks to waive from the Buy America Requirement, including name, cost, quantity(ies), country(ies) of origin, and relevant Product Service Codes (PSC) and North American Industry Classification System (NAICS) codes for each;
 - A detailed justification as to how the non-domestic item(s) is/are essential the project;
 - A certification that the recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and non-proprietary communications with potential suppliers;
 - A justification statement—based on one of the applicable justifications outlined above—as to why the listed items cannot be procured domestically, including the due diligence performed (e.g., market research, industry outreach, cost analysis, cost-benefit analysis) by the recipient to attempt to avoid the need for a waiver. This justification may cite, if applicable, the absence of any Buy America-compliant bids received for domestic products in response to a solicitation;
 - A description of the market research conducted that includes who conducted the market research, when it was conducted, sources that were used, and the methods used to conduct the research; and Anticipated impact to the project if no waiver is issued.

APPENDIX E – DEFINITION OF TECHNOLOGY READINESS LEVELS

TRL 1:	Basic principles observed and reported
TRL 2:	Technology concept and/or application formulated
TRL 3:	Analytical and experimental critical function and/or characteristic proof of concept
TRL 4:	Component and/or breadboard validation in a laboratory environment
TRL 5:	Component and/or breadboard validation in a relevant environment
TRL 6:	System/subsystem model or prototype demonstration in a relevant environment
TRL 7:	System prototype demonstration in an operational environment
TRL 8:	Actual system completed and qualified through test and demonstrated
TRL 9:	Actual system proven through successful mission operations

APPENDIX F – LIST OF ACRONYMS

BIL	Bipartisan Infrastructure Law
CETs	Critical and Emerging Technologies
CEJST	Climate and Economic Justice Screening Tool
COI	Conflict of Interest
CRADA	Cooperative Research and Development Agreement
DEC	Determination of Exceptional Circumstances
DEIA	Diversity, Equity, Inclusion, and Accessibility
DMP	Data Management Plan
DOE	Department of Energy
DOI	Digital Object Identifier
DOL	Department of Labor
EERE	Energy Efficiency and Renewable Energy
FAR	Federal Acquisition Regulation
FCOI	Financial Conflicts of Interest
FFATA	Federal Funding and Transparency Act of 2006
FOA	Funding Opportunity Announcement
FOIA	Freedom of Information Act
FFRDC	Federally Funded Research and Development Center
GAAP	Generally Accepted Accounting Principles
HBCUs	Historically Black Colleges and Universities
IPMP	Intellectual Property Management Plan
IRB	Institutional Review Board
M&O	Management and Operating
MFA	Multi-Factor Authentication
MPIN	Marketing Partner ID Number
MSI	Minority-Serving institution
MYPP	Multi-Year Program Plan
NDA	Non-Disclosure Acknowledgement
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Administration
NSF	National Science Foundation
OFCCP	Office of Federal Contractor Compliance Programs
OIG	Office of Inspector General
OMB	Office of Management and Budget
OSS	Open-Source Software
OSTI	Office of Scientific and Technical Information
OTA	Other Transactions Authority
PII	Personal Identifiable Information

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RD&D	Research, Development, and Demonstration
RFI	Request for Information
RFP	Request for Proposal
SAM	System for Award Management
SciENCv	Science Experts Network Curriculum Vita
SMART	Specific, Measurable, Achievable, Relevant, and Timely
SOPO	Statement of Project Objectives
SPOC	Single Point of Contact
STEM	Science, Technology, Engineering, and Mathematics
TAA	Technical Assistance Agreement
TIA	Technology Investment Agreement
TRL	Technology Readiness Level
UCC	Uniform Commercial Code
UEI	Unique Entity Identifier
WBS	Work Breakdown Structure
WP	Work Proposal

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