FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

Department of Energy (DOE)
Office of Fossil Energy and Carbon Management (FECM)

BIL - Rare Earth Element Demonstration Facility
Funding Opportunity Announcement (FOA) Number: DE-FOA-0002618
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<tr>
<th>FOA Issue Date:</th>
<th>09/19/2022</th>
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<td>Informational Webinar*:</td>
<td>10/13/2022 2:00-3:00 pm ET</td>
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<td>Submission Deadline for Full Applications:</td>
<td>11/21/2022 8:00pm ET</td>
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<td>Expected Date for DOE Selection Notifications:</td>
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<td>Expected Timeframe for Award Negotiations:</td>
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*Access Link to attend the Informational Webinar listed in the above table:

https://doe.webex.com/doe/j.php?MTID=m5190ad721cf03ba02bccb4e94bad16ab

Attendance is not mandatory and will not positively or negatively impact the overall review of any Applicant submissions.

To apply to this FOA, Applicants must register with and submit application materials through Grants.gov at https://www.grants.gov/.

Applicants must designate primary and backup points-of-contact with whom DOE 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.
Registration Requirements

There are several one-time actions that must be completed before submitting an application in response to this Funding Opportunity Announcement (FOA) (e.g., register with the System for Award Management (SAM), obtain a Unique Entity Identifier (UEI) number, register with Grants.gov, and register with FedConnect.net to submit questions). It is vital that Applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an Applicant’s ability to apply to this FOA.

- **SAM** – Applicants must register with SAM at [https://www.sam.gov/](https://www.sam.gov/) prior to submitting an application in response to this FOA. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Failure to register with SAM will prevent your organization from applying through Grants.gov. The Applicant must maintain an active SAM registration with current information at all times during which it has an active Federal award or application under consideration. More information about SAM registration for Applicants is found at: [https://www.fsd.gov/gsafsd_sp?id=gsafsd_kb_articles&sys_id=650d493e1bab7c105465eaccac4bcbcb](https://www.fsd.gov/gsafsd_sp?id=gsafsd_kb_articles&sys_id=650d493e1bab7c105465eaccac4bcbcb).

  **NOTE**: If clicking the SAM links do not work, please copy and paste the link into your browser.

- **UEI** – Applicants must obtain an UEI from the SAM to uniquely identify the entity. The UEI is available in the SAM entity registration record.

  **NOTE**: Subawardees/subrecipients at all tiers must also obtain an UEI from the SAM and provide the UEI to the Prime Recipient before the subaward can be issued.

  **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 utilize the HELP feature on 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](https://www.fsd.gov/gsafsd_sp?id=gsafsd_kb_articles&sys_id=650d493e1bab7c105465eaccac4bcbcb).

- **Grants.gov** – Applicants must register with Grants.gov and set up your WorkSpace. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately.
1) The Authorized Organizational Representative (AOR) must register at: https://apply07.grants.gov/apply/OrcRegister.

2) An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their MPIN from their SAM registration.

More information about the registration steps for Grants.gov is provided at: https://www.grants.gov/web/grants/applicants/registration.html.

In addition:
- **Add a Profile to a Grants.gov Account**: A profile in Grants.gov corresponds to a single Applicant organization the user represents (i.e., an Applicant) or an individual Applicant. If you work for or consult with multiple organizations and have a profile for each, you may log in to one Grants.gov account to access all of your grant applications. To add an organizational profile to your Grants.gov account, enter the UEI for the organization in the UEI field while adding a profile. For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/registration/add-profile.html.

- **EBiz POC Authorized Profile Roles**: After you register with Grants.gov and create an Organization Applicant Profile, the organization Applicant's request for Grants.gov roles and access is sent to the EBiz POC. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the AOR role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been assigned the AOR role.

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

For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/registration/authorize-roles.html.

To track your role request, refer to: https://www.grants.gov/web/grants/applicants/registration/track-role-status.html.
Questions relating to the registration process, system requirements, or how an application form works must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

- **FedConnect.net** – Applicants must register with FedConnect to submit questions. FedConnect website: [https://www.fedconnect.net/](https://www.fedconnect.net/).

See Section IV for Application and Submission Information (including how to create a WorkSpace).
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I. Funding Opportunity Description

A. Background and Context

The Department of Energy (DOE) Office of Fossil Energy and Carbon Management (FECM), in collaboration with the Office of Manufacturing & Energy Supply Chains (MESC), 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\(^1\) (IIJA), also more commonly known as the Bipartisan Infrastructure Law (BIL).

The BIL is a once-in-a-generation investment in infrastructure, which will grow a more sustainable, resilient, and equitable economy through enhancing U.S. competitiveness, driving the creation of good-paying union jobs, and ensuring stronger access to economic, environmental, and other benefits for disadvantaged communities.\(^2\) The BIL appropriates more than $62 billion to DOE\(^3\) to invest in American manufacturing and workers; expand access to energy efficiency; deliver reliable, clean and affordable power to more Americans; and deploy the technologies of tomorrow through clean energy demonstrations.

As part of and in addition to upgrading and modernizing infrastructure, DOE’s BIL investments will address the climate crisis and support efforts to build a clean and equitable energy economy that achieves zero carbon electricity by 2035 and put the United States on a path to achieve net-zero emissions economy-wide by no later than 2050\(^4\) to benefit all Americans.

The BIL will invest appropriations of $156 million for the design, construction, and operation of a Rare Earth Element (REE) Demonstration Facility that demonstrates the extraction, separation and refining from unconventional feedstock materials to high purity individual or binary rare earth metals (REM) and/or critical minerals and materials (CMM).\(^5\)

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\(^2\) Pursuant to Executive Order 14008 and the Office of Management and Budget’s Interim Justice40 Implementation Guidance M-21-28, DOE has developed a definition and tools to locate and identify disadvantaged communities. These resources can be located at [https://energyjustice.egs.anl.gov/](https://energyjustice.egs.anl.gov/). DOE will also recognize disadvantaged communities as defined and identified by the White House Council on Environmental Quality’s Climate and Economic Justice Screening Tool (CEJST), which can be located at [https://screeningtool.geoplatform.gov/](https://screeningtool.geoplatform.gov/).


\(^4\) Executive Order 14008, “Tackling the Climate Crisis at Home and Abroad” (January 27, 2021).

\(^5\) The term “Critical Material” includes critical minerals designated by the Secretary of the Interior. Section 7002(a)(2) of the Energy Act of 2020 defines critical material to mean: (A) any non-fuel mineral, element, substance, or material that the Secretary of Energy determines—(i) has a high risk of a supply chain disruption; and (ii) serves an essential function in 1 or more energy technologies, including technologies that produce, transmit, store, and conserve energy; or (B) a critical mineral. (30 U.S.C. § 1606(a)).
The activities to be funded under this FOA support BIL sections 40205 and 41003(b) and the broader government-wide approach to upgrading and modernizing infrastructure, including by strengthening critical domestic manufacturing and supply chains to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower workers, and advance environmental justice. These BIL sections are focused on:

- Creating and retaining good-paying jobs, where workers are properly classified as employees, free from discrimination and harassment, with a free and fair choice to join, form, or assist a union.
- Supporting inclusive and supportive workforce development efforts to strengthen America’s competitive advantage based on innovation, efficiency, and a skilled and diverse workforce up and down the supply chain.
- Rebuilding the U.S. leadership role in economically viable, environmentally benign extraction, separation, and processing technologies that support the generation of sustainable U.S. domestic supply chains for onshore production of REEs and CMM for commercial commodities, clean energy, and national defense industries.
- Enhancing national security by reducing the reliance of the United States on foreign competitors for critical materials and technologies.

i. Program Purpose

The United States imports more than 80% of its rare earth elements (REEs) demand from offshore suppliers. Similarly, in 2021, for at least 41 of the 50 critical minerals (CMs) on the current CM list, the United States imported more than half its consumption, with no domestic onshore production of 14 CMs. As evidenced by several Executive Orders, the recent BIL that was enacted on November 15, 2021, and DOE’s first-ever strategy on securing America’s energy supply chains, transitioning the production of these materials and their associated supply chains back to the United States is a strategic priority.

One goal of this and related DOE activities (such as the Critical Materials Institute) and those elsewhere in the government (such as the Department of Defense and Title III of the Defense Production Act) is to help build out domestic supply chains for REEs from a diversity of

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8 Executive Order 14017, America’s Supply Chain (February 24, 2021).
9 BIL, supra note 1.
10 https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain
11 https://www.ameslab.gov/cmi
sources. Other near-term planned private sector investments will help establish the first domestic midstream processing capabilities for REEs in the United States in several decades. Together, these public and private sector investments form a nationwide effort that can help provide a firm foundation for resilient, sustainable, and responsible REE supply chains.

Section 40205 of the BIL amended Section 7001 of the Energy Act of 2020 (codified at 42 U.S.C. 13344) and directs the establishment of a rare earth demonstration facility that will include a full-scale integrated REE extraction and separation facility and refinery. In coordination with the Office of Fossil Energy and Carbon Management (FECM), “(1) ... the Secretary shall fund, through an agreement with an academic partner, the design, construction, and build-out of a facility to demonstrate the commercial feasibility of a full-scale integrated rare earth element extraction and separation facility and refinery.

“(2) FACILITY ACTIVITIES.—The facility established under paragraph (1) shall—

“(A) provide environmental benefits through use of feedstock derived from acid mine drainage, mine waste, or other deleterious material;

“(B) separate mixed rare earth oxides into pure oxides of each rare earth element;

“(C) refine rare earth oxides into rare earth metals; and

“(D) provide for separation of rare earth oxides and refining into rare earth metals at a single site.”

Additionally, Section 41003(b) of the BIL authorizes appropriations for related efforts for Rare Earth Minerals Security activities in section 7001(a) of the Energy Act of 2020 (codified at 42 U.S.C. 13344(a)).

To address the BIL requirement for a demonstration facility, this FOA seeks applications from academic institutions acting as the Prime Applicant for a Phase I Front-End Engineering Design (FEED) study and a Phase II design, construction, and operation of a first-of-a-kind (FOAK), domestic, demonstration facility that produces REEs and CMM from domestic resources that include unconventional and secondary sources, such as acid mine drainage, mine waste, or other deleterious material. Examples of suitable feedstocks for this FOA include produced waste materials such as coal ash and/or other potential process waste materials from petroleum refineries, industrial byproducts (e.g., steel slag, red mud), municipal solid waste and/or sludge, that contain REE and other CMs.

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14 BIL, supra note 1 at § 40205.

15 Unconventional feedstock sources are natural resources that require greater than industry-standard levels of technology or investment to be recovered. Resources may become economical through co-production of more than one mineral or metal from the feedstock. Source: Unconventional Petroleum Resources – Geoscience Australia. https://www.ga.gov.au/scientific-topics/energy/resources/petroleum-resources/unconventional-resources


17 Examples of suitable feedstocks for this FOA include produced waste materials such as coal ash and/or other potential process waste materials from petroleum refineries, industrial byproducts (e.g., steel slag, red mud), municipal solid waste and/or sludge, that contain REE and other CMs.
This effort focuses on rebuilding the U.S. leadership role in the economically viable, environmentally benign extraction, separation, and processing technologies arena. This supports the generation of sustainable U.S. domestic supply chains for onshore production of REEs and CMM for commercial commodities, clean energy, and national defense industries, and are in support of the Administration’s goals of decarbonizing the electricity sector by 2035 and the economy by 2050. This facility will also provide environmental benefits using feedstocks derived from acid mine drainage, mine wastes, or other deleterious materials. The FOA will require projects to track and report on project results related to environmental impacts, environmental justice, community engagement, and consent-based siting, equity, and workforce development.

The REE Demonstration Facility will produce 1-3 metric tons (t)\textsuperscript{18,19} Mixed Rare Earth Oxides/Salts (MREO/MRES) per day at a minimum concentrate purity of 75 weight percent (wt%) (preferred 98wt% or greater) and subsequently processed to individual or binary separated REOs or RESs at >90% concentration by weight, culminating in the production of market-grade REMs (generally 99.9% by weight or greater, pending supply chain specifications).

DOE intends that this first-generation REE Demonstration Facility will utilize:

- **Conventional separations technologies** including physical beneficiation (as needed), chemical separation including, but not limited to, hydrometallurgy, solvent extraction for the separation of individual REE-CM oxides, and reduction to metals, with subsequent alloying of metals. Further advanced technologies will be encouraged, but only if tested and ready to be applied at demonstration scale.

- **Unconventional feedstock resources** including raw acid mine drainage (AMD) fluids and precipitates, mine wastes (refuse tailings), and/or other deleterious materials. Recycled materials as electronic wastes will not be included.

The demonstration facility will have the capability of extracting, separating, and recovering REEs and CMM from at least one unconventional or secondary source, but it may have the capability to process materials from multiple feedstock resources, demonstrating the capabilities of feedstock flexibility. REE recovery will be the primary focus of the facility with co-recovery of other CMM as permitted; however, CMM recovery (without REE recovery) is not the focus. Production quantities and concentrate material purity are identified above.

DOE requires that the domestic demonstration facility have a vertically-integrated facility (located at a single site) that provides for separation of rare earth oxides (REOs) and refining into rare earth metals (REMs) at the primary central processing and refining site. A hub-and-spoke

\textsuperscript{18} t = tonnes = metric tons

\textsuperscript{19} 1-3 t/day or ~360-1000 t/yr is ~10% of the 2019 U.S. demand, which is the production basis used in DOE FECM-NETL’s RFP Solicitation 89243320RFE000032 (Issued April 22, 2020).
configuration with satellite extraction sites, in addition to the primary central processing and refining facility, may be needed to ensure sufficient throughput for the demonstration facility.

A phased approach is currently planned, with Phase I leading to a competitive down-select to proceed to the construction and operation of the REE Demonstration Facility in Phase II. Phase I scope will include the development of an Association for the Advancement of Cost Engineering (AACE) Class 3 Cost Estimate as described in Appendix B, obtaining all required National Environmental Policy Act (NEPA) approvals, all required (or substantial progress towards obtaining) permitting for site construction and operation of the REE Demonstration Facility, detailed funding/financial plan to fulfill the 50% cost share requirement in Phase II, disposition plan for produced materials, and a detailed teaming plan for Phase II including commitment letters.

A Phase II down-select will award funds for construction, operation, and production of REE and CMM at the production quantities and concentrate material purity as previously identified. Cost, contingencies, and demonstration facility construction and operational timeline will be required.

It is expected that limited-to-no advanced research and development (R&D) technology development will be needed to support design through operation of this first-generation REE Demonstration Facility. Cost share by the award recipient will be 20% for Phase I and 50% for Phase II.

A desired feature of the demonstration facility will be the ability to accommodate slipstreams for various process circuits for testing of materials, sensors, advanced process concepts, etc., that could be developed by either the award recipient and/or other organizations as part of the award team, to demonstrate their performance and/or life during operation of the REE Demonstration Facility.

It is anticipated that the REE Demonstration Facility will be operated for a minimum of 2 calendar years after completion of facility construction, as well as shakedown of all processing circuits to demonstrate their full functional operational capabilities. Facility operation is defined as a minimum operation of 75% continuous or batch operation through all circuits required to refine and produce REM.

Only entities that receive a Phase I award will be permitted to submit a Phase II application for consideration under DOE-FECM-MESC-NETL’s competitive down-selection process. Applicants that have previously completed an AACE Class 3 FEED Study will be afforded the opportunity to apply to the FOA if certain conditions are met. See the Areas of Interest descriptions for more information.

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20 A processing circuit is defined as a reactor(s), system or facility that produces, for example, mixed rare earth oxides/salt concentrates. A subsequent processing circuit may consist of a reactor(s), system or facility that produces individually separated, high purity REOs and/or CMs. Similarly, a subsequent processing circuit may consist of a reactor(s), system or facility that is designed for the reduction of REOs to individual or binary metals for alloying and/or further refining.
In order to meet the Biden Administration’s decarbonization goals in an equitable fashion, this FOA includes requirements related to economic impact and investing in the American workforce; community and labor stakeholder engagement; energy and environmental justice and the Justice40 Initiative; and diversity, equity, inclusion and accessibility (DEIA). This ensures that the REE Demonstration Facility supported through this FOA addresses issues uniquely related to the nation’s energy transition and past development activities.

Community engagement will be central to the successful implementation of all phases of the REE Demonstration Facility. Engagement must be started early and should be continuous throughout the lifecycle of a project, but the types of engagement will change with each project phase. In addition to the engagement required during the project design/development phases, all projects funded by the REE Demonstration Facility will complete National Environmental Policy Act (NEPA) review prior to commencement of construction.

As part of the whole-of-government approach to advance equity and encourage worker organizing and collective bargaining\(^{21,22,23}\) and in alignment with BIL sections 40205 and 41003(b), this FOA and any related activities will seek to encourage meaningful engagement and participation of labor unions and underserved communities and underrepresented groups, including consultation with Tribal Nations.\(^{24,25}\) Consistent with Executive Order 14052, this FOA is designed to help meet the goal that 40% of the overall benefits from Federal investments in climate and clean energy flow to disadvantaged communities though the Justice40 Initiative, and drive the creation of good-paying union jobs through a focus on high labor standards and the free and fair chance for workers to join a union.

**ii. Technology Space and Strategic Goals**

This FOA seeks applications to address priorities in the BIL regarding the establishment of a rare earth demonstration facility as per section 40205 and rare earth minerals security as per section 41003(b). Detailed technical descriptions of the specific Areas of Interest are provided in the sections that follow.

The objectives of this FOA are to competitively select and award projects in two phases with a competitive down-select between Phase I and Phase II.

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\(^{22}\) Executive Order 14025, “Worker Organizing and Empowerment” (April 26, 2021).


\(^{24}\) Executive Order 13175, “Consultation and Coordination With Indian Tribal Governments” (November 6, 2000) charges all executive departments and agencies with engaging in regular, meaningful, and robust consultation with Tribal officials in the development of Federal policies that have Tribal implications.

Phase I projects will carry out a FEED study on a facility that will meet the following metrics:

- Facility production of at least 1-3 t per day of MREOs or MRESs at a minimum concentrate purity of 75wt% (preferred 98wt% or greater) subsequently processed to individual or binary separated REOs or RESs at >90% concentration by weight, culminating in the production of market-grade REMs (generally 99.9% by weight or greater, pending supply chain specifications).
- Facility production of CMM, as defined in Executive Order 13817\(^{26}\) and finalized in the United States Geological Survey 2022 Final List of Critical Minerals\(^{27}\) are allowed but may not be the sole focus of production (i.e., REM are required to be produced).
- Facility can be new construction; repurposing, modification, and/or extension of existing or idled facilities; or a combination of these options.
- Facility will utilize conventional technologies (including technologies that may have been commercially deployed for another application) or technologies that have undergone validation testing that demonstrates the technology is ready for deployment into the REE Demonstration Facility.
- The geographic configuration may include any of the following, but are restricted to locations within the United States:
  1. All facility circuits co-located at one location;
  2. Facility circuits located at a combination of process locations with the separation of MREO/MRES and refining into REMs being at a single, vertically-integrated location.
- Feedstock materials will, initially, be available in enough quantity to operate the system for a minimum of five years to ensure adequate supplies of feedstock exist for REE facility shakedown, operation during project demonstration, and possible continued operation after the project period of performance concludes. The feedstock will consist of acid mine drainage, mine waste, or other deleterious material as prescribed by the BIL.
- Each circuit (if multiple) and the facility in whole will operate in an environmentally benign manner; in other words, in compliance of all federal, state, and local laws and regulations with respect to emissions and waste treatment and disposal.
- Lifecycle Analysis (LCA) will be performed according to Appendix B.
- To obtain consistent performance and cost estimates, FEED studies shall be based on Association for the Advancement of Cost Engineering (AACE) International Recommended Practice No. 18R-97 Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries, Class 3 Estimate Classification.
- The project deliverable in Phase I will be a design package (FEED study) that addresses the technical and economic potential of the proposed REE Demonstration Facility to achieve the design metrics described in Appendix B.

\(^{26}\) The 35 mineral commodities deemed critical under the definition provided in the Executive Order are as follows: aluminum (bauxite), antimony, arsenic, barite, beryllium, bismuth, cesium, chromium, cobalt, fluor spar, gallium, germanium, graphite (natural), hafnium, helium, indium, lithium, magnesium, manganese, niobium, platinum group metals, potash, the rare earth elements group, rhenium, rubidium, scandium, strontium, tantalum, tellurium, tin, titanium, tungsten, uranium, vanadium, and zirconium.

• Completion of Community Benefits work, progress report, and public presentation (Appendix L).
• Development of updated Community Benefits Plans (DEIA, J40, Engagements, Jobs) for Phase II (Appendix L).

An AACE Class 3 FEED study for a 1-3 t MREO/MRES per day Demonstration Facility will be completed to meet the Phase I requirements as stated in Appendix B. Phase I requirements also include obtaining all required NEPA approvals, all required (or substantial progress towards obtaining) permitting for site construction and operation of the REE Demonstration Facility, a detailed funding/financial plan to fulfill the 50% cost share requirement in Phase II, disposition plan for produced materials, and a detailed teaming plan for Phase II including commitment letters.

NEPA Environmental Volume (EV) documents will need to be submitted with the Application and finalized 30 days after award start in order to allow for completion of other Phase II NEPA-required documents prior to application to Phase II.

Phase II will demonstrate the construction and operation of a 1-3 t MREO/MRES per day Demonstration Facility that is to be operated for the duration of 2 calendar years after completion of facility construction. Facility operation is defined as a minimum operation of 75% continuous or batch operation through all circuits required to refine and produce REM.

iii. Community Benefits Plan

To achieve the greatest impact for all Americans with this once-in-a-generation investment in infrastructure, it is critical that BIL-funded projects invest in America’s workforce, mitigate new impacts, and deliver tangible and measurable benefits to impacted communities. Projects that fail to do this may fail to gain social support, and may in turn decrease support for future projects.

To ensure projects offer opportunities, maximize benefits and minimize negative impacts, applications must include strategies to address societal considerations and impacts. For evaluation for BIL-funded projects, this FOA asks for a Community Benefits Plan in line with other BIL efforts. The Community Benefits Plan uses standard language to help Applicants applying for multiple programs, and consists of:
• A Quality Jobs Plan;
• A Diversity, Equity and Inclusion, and Accessibility (DEIA) Plan;
• A Justice40 Initiative (J40) Plan Development Proposal; and
• A Community, Labor, and Stakeholder Engagement Plan (Engagement) Development Proposal.

If awarded, Applicants must implement, evaluate, and update these plans throughout the life of the project. In addition, Applicants will be required to report on DEIA, J40, Engagement,
and Quality Jobs progress and outcomes throughout the project lifecycle and the final report. Applicants are encouraged to submit letters of support from established labor and community-based organizations that demonstrate the Applicant’s ability to achieve the above goals as outlined in the Community Benefits Plan. Within the Community Benefits Plan, the Applicant is encouraged to provide specific detail on how to ensure the delivery of measurable community and jobs benefits, e.g., through the use of tools such as good neighbor agreements, community workforce agreements, project labor agreements, other collective bargaining agreements, or similar agreements. These priorities are explained in more detail below in Section IV.C.xviii. and Appendix L.

iv. **Teaming Partner List**

DOE is compiling a “Teaming Partner List” to facilitate the formation of new project teams for this FOA. The Teaming Partner List allows organizations who may wish to participate on an application to express their interest to other Applicants and to explore potential partnerships. Participation by partners underrepresented in the industry and diverse suppliers, and by labor unions, is highly encouraged.

Updates to the Teaming Partner List will be available in the FedConnect website in the message center for this opportunity. The Teaming Partner List will be regularly updated to reflect new teaming partners who provide their organization’s information. Interested parties must register with FedConnect as an interested party to this FOA in order to have access to the FOA’s message center.

SUBMISSION INSTRUCTIONS: Any organization that would like to be included on this list should submit the following information: Organization Name, Contact Name, Contact Address, Contact Email, Contact Phone, Organization Type, Area of Technical Expertise, Brief Description of Capabilities, and Area of Interest. Interested parties shall use the Excel file titled “DOE-FOA-0002618 Teaming Partner List”, provided as an Attachment to this announcement. Submit the completed Excel sheet to DE-FOA-0002618@netl.doe.gov with the subject line “Teaming Partner Information.”

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 self-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. Areas of Interest

The FOA will consist of two Areas of Interest (AOI). AOI-1 will be for Applicants that have previously completed an AACE Class 4 Pre-FEED study that will complete a full AACE Class 3 FEED Study as part of Phase I. AOI-2 will afford Applicants the opportunity to apply to the FOA if an AACE Class 3 FEED Study has already been completed at private expense. If an Applicant has already conducted or is currently conducting activities meeting the above description of Phase I under a different award (BIL or appropriated program(s)) or at private expense, the status of such activities should be clearly described in the application (AOI-2), and only complementary (but not redundant) additional activities should be proposed. Applicants who feel they are conducting or have already conducted required Phase I activities under a different award but still want to be in consideration for Phase II awards under this FOA should propose a scope and budget for Phase I covering only those additional activities that are necessary to be ready for Phase II consideration. Updates to existing work (such as improving the cost estimate and schedule for future phases) are allowable activities in Phase I if they are not duplicative of previously completed or current work.

<table>
<thead>
<tr>
<th>Areas of Interest</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>REE Demonstration Facility pursuant to Section 40205 and Rare Earth Minerals Security pursuant to Section 41003(b).</td>
<td>AACE Class 3 FEED Study for REE Demonstration Facility</td>
</tr>
<tr>
<td>1</td>
<td>Completed AACE Class 3 FEED Study Separately Funded for REE Demonstration Facility</td>
</tr>
</tbody>
</table>

Area of Interest 1 (AOI-1) – Phase I – AACE Class 3 FEED Study for REE Demonstration Facility

An AACE Class 3 FEED study for a 1-3 t MREO/MRES/day Demonstration Facility is to be completed to meet the Phase I requirements as stated in Appendix B. Phase I requirements also include obtaining all required NEPA approvals, all required (or substantial progress towards obtaining) permitting for site construction and operation of the REE Demonstration Facility, detailed funding/financial plan to fulfill the 50% cost share requirement, detailed teaming plan for Phase II including commitment letters (for host site, feedstock, and off-take agreements), disposition plan for produced materials, and Community Benefits Plan.

The Applicant will be required to submit the results of an AACE Class 4 Pre-FEED Study (or the equivalent) as described in Appendix A. The Applicants will be required to populate Table 1 below according to the level of planned completion at the end of Phase I of the Engineering Deliverables according to an AACE Class 3 FEED Study. The Applicant will specify the degree of completion of the Engineering Deliverables (Started, Preliminary, or Complete) at the end of Phase I as specified in an AACE Class 3 FEED study and defined below. This table shall be included in the Technical Volume and will be evaluated as part of Technical Review Criteria (TRC) 1. Table 1 has been provided as an Attachment to the FOA.
Table 1: Estimate Input Checklist and Maturity Matrix for AOI-1

<table>
<thead>
<tr>
<th>Engineering Deliverables</th>
<th>Estimate Classification*</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>AACE Class 4 (current maturity at time of Phase I application)</td>
</tr>
<tr>
<td>Block Flow Diagrams</td>
<td></td>
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<tr>
<td>Plot Plans</td>
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<tr>
<td>Process Flow Diagrams (PFDs)</td>
<td></td>
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<tr>
<td>Utility Flow Diagrams (UFDs)</td>
<td></td>
</tr>
<tr>
<td>Piping &amp; Instrument Diagrams (P&amp;IDs)</td>
<td></td>
</tr>
<tr>
<td>Heat &amp; Material Balances</td>
<td></td>
</tr>
<tr>
<td>Process Equipment List</td>
<td></td>
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<tr>
<td>Utility Equipment List</td>
<td></td>
</tr>
<tr>
<td>Electrical One-Line Drawings</td>
<td></td>
</tr>
<tr>
<td>Specifications &amp; Datasheets</td>
<td></td>
</tr>
<tr>
<td>General Equipment Arrangement Drawings</td>
<td></td>
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<tr>
<td>Spare Parts Listings</td>
<td></td>
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<tr>
<td>Mechanical Discipline Drawings</td>
<td></td>
</tr>
<tr>
<td>Electrical Discipline Drawings</td>
<td></td>
</tr>
<tr>
<td>Instrumentation/Control System Discipline Drawings</td>
<td></td>
</tr>
<tr>
<td>Civil/Structural/Site Discipline Drawings</td>
<td></td>
</tr>
</tbody>
</table>

*Started (S): work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion. Preliminary (P): work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals. Complete (C): the deliverable has been reviewed and approved as appropriate.

Anticipated Technology Readiness Level (TRL)
The anticipated TRL at the beginning of the project is expected to be at TRL 6. During Phase I the anticipated TRL level is expected to remain at TRL 6.

Success Metric(s)
Projects under AOI-1 Phase I will have demonstrated the capability for securing required cost share for Phase II and completed AACE Class 3 FEED studies of the REE Demonstration Facility. These designs should provide the basis for the subsequent deployment of REE technology(ies) to support the REE Demonstration Facility construction and received (or made substantial progress toward obtaining) all permit(s) to construct and operate the facility. Completion of NEPA Environmental Assessment (EA) or Environmental Impact Statement (EIS) documentation achieving either a Finding Of No Significant Impact (FONSI) or Record Of Decision (ROD). A disposition plan for produced materials must be established. Recipients will update specific key metrics of interest,
including feedstock agreements, system costs, specific off-take agreements, sustainability metrics, and revenue potential. Phase I projects will have begun conducting two-way engagement with communities to address community concerns and will demonstrably be incorporating community priorities into the evolution and governance of the project, advance tracking of benefits and impacts, as well as plan progress for Quality Jobs, DEIA, J40, and Engagement.

**Area of Interest 2 (AOI-2) – Phase I – Completed AACE Class 3 FEED Study Separately Funded for REE Demonstration Facility**

An AACE Class 3 FEED study for a 1-3 t MREO/MRES/day Demonstration Facility will have already been completed with only minor work-rework necessary to meet the Phase I requirements as stated in Appendix B. Phase I requirements also include obtaining all required NEPA approvals, all required (or substantial progress towards obtaining) permitting for site construction and operation of the REE Demonstration Facility, detailed funding/financial plan to fulfill the 50% cost share requirement, detailed teaming plan for Phase II including commitment letters (for host site, feedstock, and off-take agreements), disposition plan for produced materials, and Community Benefits Plan.

The Applicants will be required to submit the results of an AACE Class 3 FEED Study (or the equivalent) as described in Appendix B. The Applicants will be required to populate Table 2 below according to the level of current completion and projected completion at the end of Phase I of the Engineering Deliverables according to an AACE Class 3 FEED Study. The Applicant will specify the degree of completion of the Engineering Deliverables (Started, Preliminary, or Complete) currently and at the end of Phase I as specified in an AACE Class 3 FEED study and defined below. This table shall be included in the Technical Volume and will be evaluated as part of TRC 1. Table 2 has been provided as an Attachment to the FOA.

<table>
<thead>
<tr>
<th>Engineering Deliverables</th>
<th>Estimate Classification*</th>
</tr>
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<tbody>
<tr>
<td>Block Flow Diagrams</td>
<td>AACE Class 3 (current maturity at time of Phase I application)</td>
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<tr>
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</table>
Spare Parts Listings
Mechanical Discipline Drawings
Electrical Discipline Drawings
Instrumentation/Control System Discipline Drawings
Civil/Structural/Site Discipline Drawings

*Started (S): work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion. Preliminary (P): work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals. Complete (C): the deliverable has been reviewed and approved as appropriate.

**Anticipated Technology Readiness Level (TRL)**
The anticipated TRL at the beginning of the project is expected to be at TRL 6. During Phase I the anticipated TRL level is expected to remain at TRL 6.

**Success Metric(s)**
Projects under AOI-2 Phase I will have demonstrated the capability for securing the required cost share for Phase II and completed AACE Class 3 FEED studies of the REE Demonstration Facility to meet the requirements of Appendix B not already completed under a different award (BIL or appropriated program(s)) or at private expense. These designs should provide the basis for the subsequent deployment of REE technology(ies) to support the REE Demonstration Facility construction and received (or made substantial progress toward obtaining) all permit(s) to construct and operate the facility. Completion of NEPA EA or EIS documentation achieving either a FONSI or ROD. A disposition plan for produced materials must be established. Recipients will update specific key metrics of interest, including feedstock agreements, system cost, specific off-take agreements, sustainability metrics, and revenue potential. Phase I projects will have begun conducting two-way engagement with communities to address community concerns and will demonstrably be incorporating community priorities into the evolution and governance of the project, and advance tracking of benefits and impacts, as well as plan progress for Quality Jobs, DEIA, J40, and Engagement.

**Competitive Down-Select**
Phase I AOI-1 and AOI-2 will both be competitively down-selected for a single Phase II area of interest. Only Phase I Recipients are eligible to submit a Phase II renewal application for consideration under DOE-FECM-MESC-NETL’s competitive down-selection process. For successful Phase I awardees intending to participate in the Phase II process, a Renewal Application must be submitted no later than 15 months after the start of the Phase I award. Renewal Applications are requests for additional funding for a period subsequent to that provided by a current award. DOE will evaluate the Renewal Applications against established criteria as part of a competitive process. In preparing a Renewal Application, Applicants should assume that reviewers will not have access to the Applicant’s Phase I application. The Renewal Application should be developed as fully as though the
Applicant were applying for the first time. The application must include all the information required for Phase II, plus the technical volume should discuss the results from Phase I. Detailed information on the Renewal Application requirements, submission procedure, and evaluation criteria will be provided in the cooperative agreement for the Phase I awards.

**Phase II – Construction and Operation of an REE Demonstration Facility**
Phase II will consist of the detailed design, construction, and operation of 1-3 t MREO/MRES/day REE Demonstration Facility including subsequent separation and refining to metals. After shakedown and testing, the facility will be operated for a minimum of 2 calendar years after construction. Facility operation is defined as a minimum operation of 75% continuous or batch operation through all circuits required to refine and produce REM.

*Technical Elements that Must be Included in Phase II Applications*

- Completion of Phase I requirements including an AACE Class 3 FEED Study for a 1-3 t MREO/MRES/day Demonstration Facility;
- Detailed funding/financial plan to fulfill the 50% cost share requirement;
- Necessary feedstock and disposition plan (such as off-take agreements or internal use);
- Host site agreement;
- Detailed teaming plan for Phase II including commitment letters (for feedstock, disposition of produced materials, cost sharing, host site, etc.);
- All required NEPA approvals; and
- All required (or substantial progress towards obtaining) permitting for site construction and operation of the REE Demonstration Facility.

*Anticipated Phase II Technology Readiness Level (TRL)*
The anticipated TRL at the beginning of Phase II is expected to be at TRL 6. At the completion of Phase II the anticipated TRL level is expected to be at TRL 8.

*Success Metric(s)*
Phase II project success will be measured by completing the detailed design, construction, and operation of 1-3 t MREO/MRES/day REE Demonstration Facility including subsequent separation and refining to metal(s). After shakedown and testing, the facility will be operated for a minimum of 2 calendar years. Facility operation is defined as a minimum operation of 75% continuous or batch operation through all circuits required to refine and produce REM. Success will be achieved if domestic feedstock(s) have been successfully separated and refined into metals and have been utilized in the domestic market(s). Phase II projects will continue to conduct two-way engagement, implement actions reflecting community priorities and governance activities, track and direct the flow of project benefits and impacts on communities, and achieve progress and present results on Quality Jobs, DEIA, J40, and Engagement work.
All work for projects selected under this FOA (Phase I and Phase II) must be performed in the United States. See Section IV.H.iii. and Appendix E.

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 Section I.A. and I.B. of the FOA.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- AOI-1 Only — Applications that have not completed an AACE Class 4 Pre-FEED study (or the equivalent as described by the third sentence in the lead-in paragraph of Appendix A) for 1-3 t MREO/MRES/day Demonstration Facility including subsequent refining to metals.
- AOI-1 Only — Applications with completed AACE Class 4 Pre-FEED studies for an REE Demonstration Facility that substantially deviate from the objectives of Phase I.
- AOI-2 Only — Applications that have not completed an AACE Class 3 FEED study (or the equivalent as described by the third sentence in the lead-in paragraph of Appendix B) for 1-3 t MREO/MRES/day Demonstration Facility including subsequent refining to metals with only minor work/re-work needed to bring the study into full compliance with Phase I requirements.
- AOI-2 Only — Applications with a completed AACE Class 3 FEED study (or the equivalent) for a REE Demonstration Facility that substantially deviate from the design objectives of Phase I.
- Applications that do not include tasks for obtaining NEPA approval and site permitting activities during Phase I.
- Applications that do not include MREO/MRES production as the primary materials of interest to be extracted and refined.
- Applications that do not include a plan for a single, vertically integrated location for the MREO/MRES separation and refining to metals.
- Applications that do not include plans with downstream supply chain organization(s) or other end user(s).
- Applications that use feedstock(s) other than acid mine drainage, mine waste, and/or other deleterious material. Feedstock(s) cannot be mined-for-use; bastnaesite, monazite, newly-mined coal, etc., cannot be the primary ore body. Feedstock(s) must be AMD, mine waste, and/or deleterious material but not e-waste/e-recycling.
- Applications that do not include initial feedstock resources that will allow for 5 years of operation of the REE Demonstration Facility.
- Applications that include R&D that is not limited or focused in scope to customization, de-risking, and/or optimization for integration of circuit(s) (e.g., basic R&D);
- Applications that do not provide relevant first-hand field expertise and research data and instead rely solely on literature studies to prove proposed processes.
D. Authorizing Statutes

The programmatic authorizing statutes are:

- Public Law (P.L.) 95-91, DOE Organization Act, as amended

Awards made under this announcement will fall under the purview of Title 2 of the Code of Federal Regulations (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.
II. Award Information

A. Award Overview

i. Estimated Funding

DOE expects to make a total of approximately $156 million of federal funding available for new awards under this FOA, subject to the availability of appropriated funds. DOE anticipates making approximately eight awards under this FOA in Phase I and one award (competitively down-selected) in Phase II. DOE may issue one, multiple, or no awards. DOE expects to make Federal funding available for new awards under this FOA as follows:

<table>
<thead>
<tr>
<th>Phase I</th>
<th>Total Value</th>
<th>Anticipated No. of Awards</th>
<th>Anticipated Individual Award Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DOE Share $/%</td>
<td>Cost Share $/%</td>
<td>Total $</td>
</tr>
<tr>
<td>1</td>
<td>Up to $32M/80%</td>
<td>Up to $8M/20%</td>
<td>Up to $40M</td>
</tr>
<tr>
<td>2</td>
<td>Up to $8M/80%</td>
<td>Up to $2M/20%</td>
<td>Up to $10M</td>
</tr>
<tr>
<td>Total</td>
<td>Up to $32M/80%</td>
<td>Up to $8M/20%</td>
<td>Up to $40M</td>
</tr>
</tbody>
</table>

*The DOE share listed under the anticipated individual award size is the maximum amount of DOE funding that can be proposed for each Area of Interest. Applications that propose a DOE share in excess of these limits will not be evaluated.

**Applicants may propose cost share in excess of 20% which could result in higher total award values than those stated above.

<table>
<thead>
<tr>
<th>Phase II</th>
<th>Total Value</th>
<th>Anticipated No. of Awards</th>
<th>Anticipated Individual Award Size</th>
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<tr>
<td></td>
<td>DOE Share $/%</td>
<td>Cost Share $/%</td>
<td>Total $</td>
</tr>
<tr>
<td>Total</td>
<td>Up to $124M/50%</td>
<td>Up to $124M/50%</td>
<td>Up to $248M</td>
</tr>
</tbody>
</table>

*The DOE share listed under the anticipated individual award size is the maximum amount of DOE funding that can be proposed for each Area of Interest. Applications that propose a DOE share in excess of these limits will not be evaluated.

**Applicants may propose cost share in excess of 50%, which could result in higher total award values than those stated above.

APPLICATIONS WHICH EXCEED THE “Maximum DOE Share for Any One Individual Award (Federal Share)” SPECIFIED ABOVE WILL BE CONSIDERED NONCOMPLIANT (SEE SECTION III COMPLIANCE CRITERIA). DOE WILL NOT REVIEW OR CONSIDER NONCOMPLIANT APPLICATIONS.
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. Before the expiration of the initial budget period(s), DOE may perform a down-select among different recipients and provide additional funding only to a subset of recipients.

ii. **Period of Performance**
   This FOA will result in cooperative agreements with up to a 69-month project period composed of Phase I lasting 21 months and Phase II lasting 48 months. Continuation into Phase II will be governed by a competitive down-select.

   **Phase I** – 21 months for FEED Study, including obtaining NEPA approval for the REE Demonstration Facility, other permitting approvals for the demonstration facility, proof of adequate partnerships, and funding plan for obtaining the required cost share for Phase II. Applications for Phase II due at 15 months.

   **AOI-1** Phase I Recipients are allotted a 15-month technical period of performance for Phase I and an administrative period of 6 months to allow time for DOE to execute a Phase II competitive down-selection process.

   **AOI-2** Phase I Recipients are allotted a 15-month technical period of performance for Phase I and an administrative period of 6 months to allow time for DOE to execute a Phase II competitive down-selection process.

<table>
<thead>
<tr>
<th></th>
<th>FOA (Phase I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOI</td>
<td>Technical Period of Performance</td>
</tr>
<tr>
<td>1</td>
<td>15 months</td>
</tr>
<tr>
<td>2</td>
<td>15 months</td>
</tr>
</tbody>
</table>

   **Phase II** – 48 months with up to 24 months for facility construction and shakedown and subsequent operation for the duration of 2 calendar years. Facility operation is defined as a minimum operation of 75% continuous or batch operation through all circuits required to refine and produce REM.

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 United States 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.ix of the FOA for more information on what substantial involvement may involve.
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. Restricted Eligibility – Prime Recipient

In accordance with 2 CFR 910.126, Competition, eligibility to apply as a Prime Recipient is restricted to academic institutions (see below for domestic requirement). DOE is restricting eligibility per Section 40205 of the BIL, which amended Section 7001 of the Energy Act of 2020 (codified at 42 U.S.C. 13344). The section requires the establishment of a rare earth element demonstration facility that will include a full-scale integrated rare earth element extraction and separation facility and refinery. Specifically, in coordination with the Office of Fossil Energy and Carbon Management (FECM), “(1) ... the Secretary shall fund, through an agreement with an academic partner, the design, construction, and build-out of a facility to demonstrate the commercial feasibility of a full-scale integrated rare earth element extraction and separation facility and refinery.”

ii. Domestic Entities

The proposed prime recipient (restricted to academic institutions) and subrecipient(s) must be domestic entities. 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.

The following types of domestic entities are eligible to participate as a subrecipient of this FOA:
1. Institutions of higher education;
2. For-profit entities;
3. Non-profit entities; and
4. State and local governmental entities, and tribal nations.

DOE/NNSA FFRDCs are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient. **NETL is not eligible for award under this announcement and may not be proposed as a subrecipient on another entity’s application. An application that includes NETL as a prime recipient or subrecipient will be considered non-responsive.**

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28 An “agreement” for purposes of this FOA is interpreted as a cooperative agreement between DOE and the prime applicant that will result from the competitive FOA.
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 United States 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.

iii. Foreign Entities
In limited circumstances, DOE may approve a waiver to allow a foreign entity that does not meet the definition of “domestic” (provided above) to participate as a subrecipient. 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 E 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.

iv. Incorporated Consortia
Incorporated consortia that quality as domestic are eligible to participate as a subrecipient. Please refer to “Domestic Entities” above. For consortia incorporated (or otherwise formed) in a foreign country, please refer to the requirements in “Foreign Entities” above. If the consortium includes foreign members, the Applicant must submit a separate explicit written waiver request in the Full Application for each foreign member. See Appendix E.

Each consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE Contracting Officer.

v. Unincorporated Consortia
Unincorporated Consortia that quality as domestic are eligible to participate as a subrecipient. Unincorporated Consortia must designate one member of the consortium to serve as the subrecipient/consortium representative. The subrecipient/consortium representative must qualify as a domestic entity. Please refer to “Domestic Entities” above.

Upon request, unincorporated consortia must provide the DOE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets
out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should include the consortium’s:

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

If the consortium includes foreign members, the Applicant must submit a separate explicit written waiver request in the Full Application for each foreign member. See Appendix E.

B. Cost Sharing

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

Phase I Cost Share: The cost share must be at least 20% of the total project costs for research and development projects. The cost share must come from non-federal sources unless otherwise allowed by law.

Phase II Cost Share: The cost share must be at least 50% of the total project costs for demonstration projects. The cost share must come from non-federal sources unless otherwise allowed by law.

To assist Applicants in calculating proper cost share amounts, DOE has included a cost share information sheet and sample cost share calculation as Appendices C and D 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.

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29 Total project costs is the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.
31 Total project costs is the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.
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 project as a whole is met.

iii. **Cost Share Types and Allowability**
Every cost share contribution must be allowable under the applicable federal cost principles, as described in Section IV.H.i. of the FOA. In addition, cost share must be verifiable upon submission of the Full Application.

Project teams may provide cost share in the form of cash or in-kind contributions. 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 funding was not provided to the state or local government by the federal government (unless otherwise authorized by law).

The prime recipient may not use the following sources to meet its cost share obligations including, but not limited to:

- 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 and other Federal agencies**
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. Unless otherwise authorized by law, Federal funds contributed by other federal agencies and instrumentalities may not be accounted for as part of the non-federal cost share.

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 C 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).

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

Full Applications must meet all compliance criteria listed below or they will be considered noncompliant. DOE will not review or consider noncompliant submissions, including Full Applications that were: submitted through means other than specifically stated in the FOA; submitted after the applicable deadline; and/or submitted incomplete. DOE will not extend the submission deadline for Applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

Full Applications are deemed compliant if:

- The Full Application complies with the maximum DOE share of the individual award size in Section II.A. of the FOA;
- The Full Application complies with the content and form requirements in Section IV.C. of the FOA; and
- The Applicant successfully uploaded all required documents and clicked the “Submit” button in Grants.gov by the deadline stated in the FOA.

D. Responsiveness Criteria

A review of all submitted documents and information is performed to determine if the submissions are responsive to the FOA requirements. All submitted information and documents must meet all of the Responsiveness Criteria listed below to be eligible for review or the submission will be considered non-responsive. DOE will NOT review or consider non-responsive submissions.

Full Applications are deemed responsive if:

- The application meets the technical requirements as described in the “Objectives/Areas of Interest” contained in Section I.B of the FOA; and
- The Applicant/application meets the Eligibility Criteria in Section III of the FOA.

Only compliant/responsive applications will be eligible for a comprehensive merit review.

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 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. **Value/Funding**  
The value of, and funding for, the FFRDC/NL portion of the work will be included in the award to a successful Applicant. DOE/NNSA will not fund a DOE/NNSA FFRDC/NL through the DOE field work authorization process and other FFRDC/NLs through an interagency agreement with the sponsoring agency. FFRDCs/NLs will be treated as subawards for Applicants. Subawards to other FFRDCs will utilize the terms and conditions of the sponsoring agency.

d. **Cost Share**  
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/NL’s portions of the effort.

e. **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. **Limit on FFRDC Effort**  
The FFRDC effort, in aggregate, shall not exceed 25% of the total estimated cost of the project, including the Applicant’s and the FFRDC’s portions of the effort.

g. **Agreement Requirements for DOE/NNSA FFRDC/NLs Participating as a Subrecipient**
DOE/NNSA FFRDC/NLs participating as a subrecipient on a project are strongly encouraged to establish a cooperative research and development agreement\(^{33}\) (CRADA) or, if the role of the DOE/NNSA FFRDC/NL is limited to technical assistance and intellectual property is not anticipated to be generated from the DOE/NNSA FFRDC/NL’s work, a Technical Assistance Agreement (TAA), with at least the prime recipient before any project work begins.

The CRADA or TAA is used to ensure accountability for project work and provide the appropriate management of intellectual property (IP), e.g., data protection and background IP.

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 submit an application in response to this FOA lies solely with the Applicant.

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\(^{33}\) 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](https://www.energy.gov/gc/downloads/doe-cooperative-research-and-development-agreements)
IV. Application and Submission Information

A. Application Process

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 Grants.gov at https://www.grants.gov/, unless specifically stated otherwise in the FOA. **DOE will not review or consider submissions submitted through means other than specifically stated in the FOA, 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.

Full Applications must conform to the following requirements:

- 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 inch 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;
- 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 (or double-spaced where specified). The maximum page limitation includes the cover page, references, charts, graphs, data, maps, photographs, other pictorial presentations, and other reference material the Applicant may include its submission.

Applicants are responsible for meeting each submission deadline. **Applicants are strongly encouraged to submit their Full Applications at least 48 hours in advance of the submission deadline.** Under normal conditions (i.e., at least 48 hours in advance of the submission deadline), Applicants should allow at least 1 hour to submit a Full Application. Once a Full Application is submitted as specifically stated in the FOA, 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 Full Application before the applicable deadline.
DOE urges Applicants to carefully review their Full Applications to allow sufficient time for the submission of 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.

B. Application Forms
The application forms and instructions are available on Grants.gov at https://www.grants.gov/.

Note: The maximum file size that can be uploaded to the Grants.gov website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB 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

C. Content and Form of the Full Application
Applicants must submit a Full Application by the specified due date and time to be considered for funding under this FOA. Applicants must complete the following application forms found on the Grants.gov website at https://www.grants.gov/ in accordance with the instructions.

i. Full Application Content Requirements

Each Full Application must be limited to a single concept or technology. Do not consolidate unrelated concepts and technologies in a single Full Application. Full Applications must conform to the following content and form 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.

<table>
<thead>
<tr>
<th>Component</th>
<th>File Format</th>
<th>Page Limit</th>
<th>File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF-424</td>
<td>Form</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Project/Performance Site Location(s)</td>
<td>Form</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Technical Volume</td>
<td>PDF</td>
<td>40</td>
<td>TechnicalVolume.pdf</td>
</tr>
<tr>
<td>Resumes</td>
<td>PDF</td>
<td>2 pages each</td>
<td>Resumes.pdf</td>
</tr>
<tr>
<td>Letters of Commitment</td>
<td>PDF</td>
<td>1 page each</td>
<td>LOC.pdf (or “LOC-FILL IN TEAM MEMBER.pdf” if more than letter is submitted)</td>
</tr>
<tr>
<td>Host Site Commitment Letter</td>
<td>PDF</td>
<td>1 page each</td>
<td>HSCL.pdf</td>
</tr>
<tr>
<td>Statement of Project Objectives</td>
<td>MS Word</td>
<td>15</td>
<td>SOPO.doc or docx</td>
</tr>
<tr>
<td>File Name Description</td>
<td>Format</td>
<td>Page</td>
<td>File Name</td>
</tr>
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<td>-------------------------------------------------------------------------------------</td>
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<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Summary/Abstract for Public Release</td>
<td>PDF</td>
<td>1</td>
<td>Summary.pdf</td>
</tr>
<tr>
<td>Summary Slide</td>
<td>MS PowerPoint</td>
<td>1</td>
<td>Slide.ppt or pptx</td>
</tr>
<tr>
<td>Budget Justification Workbook</td>
<td>MS Excel</td>
<td>N/A</td>
<td>Recipient_Budget_Justification.xls or xlsx</td>
</tr>
<tr>
<td>Subrecipient Budget Justification</td>
<td>MS Excel</td>
<td>N/A</td>
<td>Subrecipient_Budget_Justification.xls or xlsx</td>
</tr>
<tr>
<td>Budget for DOE/NNSA FFRDC/NL or non-DOE/NNSA FFRDC/NL, if applicable</td>
<td>PDF</td>
<td>N/A</td>
<td>Use up to 10 letters of the FFRDC/NL name plus “Budget” as the file name (e.g., FFRDC/NL_nameBudget.xls or xlsx), and click on &quot;Add Optional Other Attachment&quot; to attach.</td>
</tr>
<tr>
<td>Authorization from cognizant Contracting Officer for FFRDC</td>
<td>PDF</td>
<td>N/A</td>
<td>FFRDCAuth.pdf</td>
</tr>
<tr>
<td>SF-LLL Disclosure of Lobbying Activities</td>
<td>Form</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Waiver Request: Subrecipient Foreign Entity Participation (waiver), if applicable</td>
<td>PDF</td>
<td>N/A</td>
<td>FN_Waiver Subawardee Name.pdf</td>
</tr>
<tr>
<td>Waiver Request: Performance of Work in the United States (Foreign Work Waiver), if applicable</td>
<td>PDF</td>
<td>N/A</td>
<td>PerformanceofWork_Waiver.pdf</td>
</tr>
<tr>
<td>Waiver Request: Buy America Requirements for Infrastructure Projects, if applicable</td>
<td>PDF</td>
<td>N/A</td>
<td>BAWaiver.pdf</td>
</tr>
<tr>
<td>Data Management Plan</td>
<td>PDF</td>
<td>N/A</td>
<td>DMP.pdf</td>
</tr>
<tr>
<td>Community Benefits Plan</td>
<td>PDF</td>
<td>18</td>
<td>CBP.pdf</td>
</tr>
<tr>
<td>Current and Pending Support</td>
<td>PDF</td>
<td>N/A</td>
<td>CPS.pdf</td>
</tr>
<tr>
<td>Intellectual Property Management Plan</td>
<td>PDF</td>
<td>N/A</td>
<td>IPMP.pdf</td>
</tr>
<tr>
<td>Locations of Work</td>
<td>Excel</td>
<td>N/A</td>
<td>LOW.xls or xlsx</td>
</tr>
<tr>
<td>Preliminary Environmental Volume</td>
<td>PDF</td>
<td>N/A</td>
<td>EV.pdf</td>
</tr>
<tr>
<td>Environmental Questionnaire</td>
<td>PDF</td>
<td>N/A</td>
<td>Env.pdf (or “Env-FILL IN TEAM MEMBER.pdf” if more than questionnaire is submitted)</td>
</tr>
<tr>
<td>Technology Maturation Plan</td>
<td>PDF</td>
<td>15</td>
<td>TMP.pdf</td>
</tr>
<tr>
<td>Project Management Plan</td>
<td>PDF</td>
<td>15</td>
<td>PMP.pdf</td>
</tr>
<tr>
<td>Funding Plan (including cost share commitment letters and financial model)</td>
<td>PDF</td>
<td>N/A</td>
<td>Funding_Plan.pdf Model.xls or xlsx</td>
</tr>
<tr>
<td>AACE Class 4 Pre-FEED Requirements (AOI-1 only)</td>
<td>PDF</td>
<td>N/A</td>
<td>Pre-FEED.pdf</td>
</tr>
<tr>
<td>AACE CLASS 3 FEED Requirements (AOI-2 only)</td>
<td>PDF</td>
<td>N/A</td>
<td>FEED.pdf</td>
</tr>
</tbody>
</table>

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10MB 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 10MB.**

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

ii. **SF-424: Application for Federal Assistance**

Complete the SF 424 form first to populate data in other forms. Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at [https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients](https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients), under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period of performance and not just the first project year, first phase or other subset of the project period of performance.

iii. **Project/Performance Site Location(s)**

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

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

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

iv. **Technical Volume**

The Technical Volume must be submitted in PDF format. The Technical Volume must conform to the following content and form requirements, including maximum page lengths. This volume must address the Technical Review Criterion 1-3 and associated sub-criterion as discussed in Section V of the FOA. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these technical review criterion. Save the Technical Volume in a single PDF file using the following convention for the title “TechnicalVolume.pdf” and click on "Add Mandatory Other Attachment" to attach.
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 40 pages when printed using standard 8.5 x 11 paper with 1” margins (top, bottom, left, and right) single-spaced with font not smaller than 12 point (except in figures or tables, which may be 10 point font), including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all of the information in the table below. The Applicant should consider the weighting of each of the technical review criterion (see Section V of the FOA) when preparing the Technical Volume.

The Technical Volume must conform to the following content requirements:

<table>
<thead>
<tr>
<th>SECTION/PAGE LIMIT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Page</td>
<td>The cover page should include the project title, the specific FOA Area of Interest being addressed (if applicable), host site location, both the technical and business points of contact, names of all team member organizations, names of the senior/key personnel and their organizations, the project location(s), and any statements regarding confidentiality.</td>
</tr>
</tbody>
</table>
| Project Overview   | The Project Overview should contain the following information:  

- **Background:** The Applicant should discuss the background of their 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 explicitly identify the targeted improvements to the baseline technology and the critical success factors in achieving that goal, including the ways in which the proposed project location and related infrastructure, workforce, etc. will contribute to the success of the overall project.  

- **DOE Impact:** The Applicant should discuss the impact that DOE funding would have on the proposed project. Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.  

- **Identify any potential long-term constraints project will have on community’s access to natural resources (e.g., water) and Tribal cultural resources. Describe a long-term cleanup strategy that ensures communities and neighborhoods remain healthy and safe and not burden with cleanup costs and waste.** |
| Technical Description, Innovation, and Impact (Approximately 35% of the Technical Volume) | The Technical Description should contain the following information:

- Relevance and Outcomes: The Applicant should provide a detailed description of the technology, including the scientific and other principles and objectives that will be pursued during the project. This section should describe the relevance of the proposed project to the goals and objectives of the FOA, including the potential to meet specific DOE technical targets or other relevant performance targets. The Applicant should clearly specify the expected outcomes of the project.

- Feasibility: The applicant should demonstrate the technical feasibility of the proposed technology and capability of achieving the anticipated performance targets, including a description of previous work done and prior results. This section should also address the project’s access to necessary infrastructure (e.g., transportation, water, electric transmission), including any use of existing infrastructure, as well as to a skilled workforce.

- Innovation and Impacts: The Applicant should describe the current state-of-the-art in the applicable field, the specific innovation of the proposed technology, the advantages of proposed technology over current and emerging technologies, and the overall impact on advancing the state-of-the-art/technical baseline if the project is successful.

- Technical Review Criterion 1: The Applicant should address each technical review criteria individually. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with technical review criteria. |

| Technical Approach and Project Management Plan (Approximately 20% of the Technical Volume) | The Technical Approach 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 and Project Management Plan are separately requested. The Technical Approach should contain the following information:

- Project Objectives: The Applicant should provide a clear and concise (high-level) statement of the goals and objectives of the project as well as the expected outcomes.

- 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 detailed 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 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.

**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 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):** 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. The Applicant should also provide the specific technical 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 2 pages of the Workplan, include a short statement on whether the project...
will involve the construction, alteration, and/or repair of infrastructure in the United States. See Appendix F for applicable definitions and other information to inform this statement.

- **Project Management:** The Applicant should discuss the team’s proposed management plan, including the following:
  - 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

  The summary provided should be consistent with the PMP (see Appendix I). The PMP will contain more detailed information.

- **Market Transformation Plan:** The Applicant should provide a market transformation plan, including the following:
  - Identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including a mitigation plan.
  - Identification of a product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, data dissemination, and product distribution.

- **Technical Review Criterion 2:** The Applicant should address each technical review criteria individually. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with technical review criteria.

### Technical Qualifications and Resources (Approximately 25% of the Technical Volume)

The Technical Qualifications and Resources should contain the following information:

- Describe the project team’s unique qualifications and expertise, including those of key subrecipients.
- Describe 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.

- This section should also include relevant, previous work efforts (of similar size, scope, and complexity), demonstrated innovations, and how these enable the Applicant to achieve the project objectives.

- Describe the time commitment of the key team members to support the project.

- Describe the technical services to be provided by DOE/NNSA FFRDCs, if applicable.

- For multi-organizational or multi-investigator projects, describe succinctly:
  - The roles and the work to be performed by each PI and senior/key personnel;
  - Business agreements between the Applicant and each PI and senior/key personnel;
  - How the various efforts will be integrated and managed;
  - Process for making decisions on scientific/technical direction;
  - Publication arrangements;
  - Intellectual Property issues; and
  - Communication plans

- Technical Review Criterion 3: The Applicant should address each technical review criteria individually. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with technical review criteria.

v. Resumes
A resume provides information that can be used by reviewers to evaluate the individual’s relevant skills, experience of the key project personnel. Applicants must submit a two-page resume for each Project Director and key personnel that includes the following:

1. Contact Information;
2. Education: Include all academic institutions attended, major/area, degree;
3. Training: (e.g.,) certification or credential from a Registered Apprenticeship or Labor Management Partnership
4. Professional Experience: Beginning with the current position, list professional/academic positions in chronological order with a brief description;
5. 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;
6. A list of up to 10 publications most closely related to the proposed project. For each
publication, identify the names of all authors (in the same sequence in which they
appear in the publication), the article title, book or journal title, volume number, page
numbers, year of publication, and website address if available electronically. Patents,
copyrights, and software systems developed may be provided in addition to or
substituted for publications. An abbreviated style such as the Physical Review Letters
(PRL) convention for citations (list only the first author) may be used for publications
with more than 10 authors; and
7. There should be no lapses in time over the past ten years or since age 18, which ever
time 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/, and is also available at
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
“Resumes.pdf” and click on "Add Optional Other Attachment" to attach.

vi. Letters of Commitment (if applicable)
If applicable, Applicants can include letters of commitment from:
- critical stakeholders (e.g., supply chain, financial investors, etc.)
- suppliers (e.g. feedstock, consumables, etc.)
- partners
- end users
  - future customers
- labor unions
- community-based organizations

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

Each letter must not exceed 1 page. Save the letters of commitment in a single PDF file using
the following convention for the title “LOC.pdf” (or “LOC-FILL IN TEAM MEMBER.pdf” if more
than letter is submitted) and click on "Add Optional Other Attachment" to attach.
vii. **Host Site Commitment Letter**
The Applicant must demonstrate that the host site proposed has agreed to participate in (and provide site access for) the project and must confirm that the site is located in the United States. Host Site Commitment Letter(s) must be signed by the person authorized to commit resources on behalf of the organization and be provided in PDF format. Save this information in a single file named “HSCL.pdf” and click on “Add Optional Other Attachment” to attach.

viii. **Statement of Project Objectives (SOPO)**
Applicants are required to complete a SOPO. A SOPO template is available as an Appendix G of the FOA. The SOPO, including the Deliverables Table, must not exceed 15 pages when printed using standard 8.5 x 11 paper with 1” margins (top, bottom, left, and right) double spaced 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 “SOPO.doc or docx” and click on "Add Optional Other Attachment" to attach.

ix. **Summary/Abstract for Public Release**
Applicants are required to submit a one-page summary/abstract of their project. The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the Applicant, the Project Director, 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), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as DOE may make it available to the public after selections are made. The project summary must not exceed 1 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 convention for the title “Summary.pdf” and click on “Add Optional Other Attachment” to attach.

x. **Summary Slide**
Applicants are required to provide a single slide summarizing the proposed project.

The Summary Slide template requires 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, Project Director, senior/key personnel information, and subrecipient(s), if applicable; 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 “Slide.ppt or pptx” and click on “Add Optional Other Attachment” to attach.

xi. Budget Justification Workbook
Applicants are required to complete the Budget Justification Workbook. This workbook is included as an attachment to this announcement. Prime recipients must complete each tab of the Budget Justification Workbook for the project as a whole, including all work to be performed by the prime recipient and its subrecipients and contractors. Applicants should include costs associated with implementing the Community Benefits Plan, and with required annual audits and incurred cost proposals in their proposed budget documents. 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 “Recipient_Budget_Justification.xls or xlsx” and click on “Add Optional Other Attachment” to attach.

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 percent of the total work effort (whichever is less). A Budget Justification workbook is included as an attachment to this announcement. The budget justification must include the same justification information described in the “Budget Justification Workbook” section above. Save each subrecipient budget justification in a Microsoft Excel file using the following convention for the title “Subrecipient_Budget_Justification.xls or xlsx” and click on “Add Optional Other Attachment” to attach.

xiii. Budget for DOE/NNSA FFRDC or non-DOE/NNSA FFRDC/NLs, (if applicable)
If proposed, FFRDC/NLs will be treated as subawards for Applicants. Therefore, prepare the budgets utilizing rates appropriate for such an arrangement. You must provide a separate detailed budget justification for each FFRDC/NL proposed that is expected to perform work estimated to be more than $250,000 or 50 percent of the total work effort (whichever is less). A Budget Justification workbook is included as an attachment to this announcement. The level of detail to be included in the FFRDC/NL budget justification (if applicable) must be commensurate with that provided by the Recipient. Use up to 10 letters of the FFRDC/NL name plus “Budget” as the file name (e.g., FFRDC/NL_nameBudget.xls or xlsx), and click on "Add Optional Other Attachment" to attach.

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 “FFRDCAuth.pdf” and click on “Add Optional Other Attachment” to attach.

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

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” 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.

xvi. **Waiver Requests (if applicable)**

i. **Subrecipient Foreign Entity Participation (Foreign Entity Waiver)**

For projects selected under this FOA, as set forth in Section III.A.ii., subrecipients must be domestic, *i.e.*, 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. To request a waiver of this requirement, the Applicant must submit an explicit waiver request in the Full Application. Appendix E lists the information that must be included in a waiver request.

Save the Waivers in a single PDF file using the following convention for the title “FN_Waiver-Subawardee name.pdf” and click on “Add Optional Other Attachment” to attach.

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

As set forth in Section IV.H.iii., all work for 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 E 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 “PerformanceofWork_Waiver.pdf” and click on “Add Optional Other Attachment” to attach.

iii. **Waiver of the Buy America Requirement for Infrastructure Projects**
As set forth in Section IV.H.vii., federally assisted projects which involve infrastructure, undertaken by applicable recipient types, require that:

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

In limited circumstances, DOE may grant a waiver of this requirement. Appendix F to this FOA provides guidance on how “infrastructure work” is defined, explains the applicable justifications under which a waiver may be granted, and lists the information that must be included in the waiver request.

Save the Waivers in a single PDF file using the following convention for the title “BAWaiver.pdf” and click on “Add Optional Other Attachment” to attach.

xvii. Data Management Plan (DMP)

Applicants are required to submit a Data Management Plan as part of their Full Application. The Data Management Plan is a document that outlines the proposed plan for data sharing or preservation. Submission of this plan is required with the full application, and failure to submit the plan may result in rejection of the application without further consideration. Applicants shall prepare the DMP in the format provided in Appendix H of this FOA. Save this plan in a single file named DMP.pdf and click on “Add Optional Other Attachment” to attach.”

xviii. Community Benefits Plan

Development, demonstration and deployment will likely be more successful if equity and justice principles and community and labor engagement and partnership development are integrated into funding opportunities. For example, failing to meaningfully engage with communities and labor stakeholders has been a contributing factor to delays or cancellations of energy and carbon management projects in the past. However, with meaningful engagement, communities and labor stakeholders can be project partners whose questions and concerns can improve overall project outcomes. This is clear from feedback obtained from stakeholders of the Office of Fossil Energy and Carbon Management, requests for information, published research, and Office learnings from project work.

34 https://usea.org/event/department-energy-public-community-listening-session-regarding-carbon-management
35 https://usea.org/event/virtual-carbon-management-applicant-education-workshop
36 https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%2f%3fdoc%3dDE-FOA-0002660&agency=DOE
37 https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2ffedconnect%2f%3fdoc%3dDE-FOA-0002686&agency=DOE
Therefore, a Community Benefits Plan is required, which consists of:

- A Quality Jobs Plan;
- A Diversity, Equity and Inclusion, and Accessibility (DEIA) Plan;
- A Justice40 Initiative (J40) Plan Development Proposal; and
- A Community and Stakeholder Engagement Plan Development Proposal.

Each plan, when fully developed, should include at least one SMART (Specific, Measurable, Achievable, Relevant, and Timely) milestone per budget period supported by metrics to measure the success of the proposed actions.

The Community Benefits Plan will be evaluated as part of the technical review process. It includes content for all four elements, and if awarded, Applicants must implement, evaluate, and update these plans throughout the life of the project. In addition, Applicants will be required to report on societal considerations progress and outcomes throughout the project lifecycle and the final report if selected. In addition to ongoing updates to the plans, this involves:

- Updated J40 and Engagement Plan Development Proposals at 90 days;
- J40 and Engagement Plans, submitted 90 days after updated Plan Development Proposals are submitted;
- A public presentation and peer review on the Community Benefits work in a Mid-Project Update halfway through the performance period.
- A Community Benefits Progress Report at end of award.

Applicants to this FOA are required to include information about how their project will support these efforts as described below and detailed in Appendix L. The Community Benefits Plan must be submitted in PDF format and must not exceed eighteen pages. This Plan must address the technical review criterion titled, “Community Benefits Plan.” See Section V. of the FOA.

Save the Community Benefits Plan in a single PDF file using the following naming convention for the title “CBP.pdf” and click on “Add Optional Other Attachment” to attach.

**Quality Jobs**

As an agency whose mission includes strengthening our country’s energy prosperity, the DOE strongly supports investments that expand jobs with prevailing wages, improve job quality through the adoption of strong labor standards, and support responsible employers. DOE also supports strategies that develop a skilled and inclusive local workforce to build and maintain the country’s energy infrastructure and grow domestic manufacturing. The Quality Jobs Plan asks Applicants to describe their plans to attract, train, and retain a skilled and well qualified workforce to ensure project stability, continuity, and success.
Diversity, Equity, Inclusion, and Accessibility

DOE supports opportunities that improve job access and foster safe, healthy, and inclusive workplaces and communities. Applicants are highly encouraged to include individuals from groups historically underrepresented\textsuperscript{38,39} in STEM and/or applicable workforces on their project teams. Minority Serving Institutions, Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or entities located in an underserved community that meet the eligibility requirements are encouraged to apply as the Prime Applicant or participate on an application as a proposed partner to the Prime Applicant.

Applicants are also required to describe how diversity, equity, inclusion, and accessibility objectives will be incorporated throughout the life of the project in a DEIA Plan that describes the actions the Applicant will take to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM and/or applicable workforces, provide quality pre-apprenticeships and supportive services for individuals with barriers to career-track training and employment, advance equity, and encourage the inclusion of individuals from these groups in the project.

Justice40 Initiative

Executive Order 14008 created the Justice40 Initiative – which established a goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities.\textsuperscript{40} This calculation of overall benefits of certain federal investments is not on a per-project basis, meaning that individual projects may contribute more or less substantially to this goal (i.e., have a higher or lower percentage) based on factors unique to the project. Benefits include (but are not limited to) measurable direct or indirect investments or positive project outcomes that achieve or contribute to the following in disadvantaged communities: (1) a decrease in energy burden; (2) a decrease in environmental exposure and burdens; (3) an increase in access to low-cost capital; (4) an increase in job creation, the clean energy job

\textsuperscript{38} According to the National Science Foundation’s 2019 report titled, “Women, Minorities and Persons with Disabilities in Science and Engineering”, women, persons with disabilities, and underrepresented minority groups—blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are vastly underrepresented in the STEM (science, technology, engineering and math) fields that drive the energy sector. That is, their representation in STEM education and STEM employment is smaller than their representation in the U.S. population. \url{https://ncses.nsf.gov/pubs/nsf19304/digest/about-this-report}. For example, in the U.S., Hispanics, African Americans and American Indians or Alaska Natives make up 24 percent of the overall workforce, yet only account for 9 percent of the country’s science and engineering workforce. DOE seeks to inspire underrepresented Americans to pursue careers in energy and support their advancement into leadership positions. \url{https://www.energy.gov/articles/introducing-minorities-energy-initiative}

\textsuperscript{39} Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities/Other Minority Institutions as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR’s Department of Education U.S. accredited postsecondary minorities’ institution list. See \url{https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html}

\textsuperscript{40} The Justice40 initiative, created by Executive Order 14008, establishes a goal that 40% of the overall benefits of certain federal investments flow to (disadvantaged communities). The Justice40 Interim Guidance provides a broad definition of disadvantaged communities (Page 2): \url{https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf}. The DOE, OMB, and/or the Federal Council on Environmental Quality (CEQ) may issue additional and subsequent guidance regarding the designation of disadvantaged communities and recognized benefits under the Justice40 Initiative.
pipeline, and job training for individuals; (5) increases in clean energy enterprise creation and contracting (e.g., minority-owned or disadvantaged business enterprises); (6) increases in energy democracy, including community ownership; (7) increased parity in clean energy technology access and adoption; and (8) an increase in energy resilience. Recipients of DOE funds should ensure that performance of project tasks within disadvantaged communities meaningfully benefits disadvantaged communities and does not result in increased burden to the disadvantaged community.

Applicants to this funding opportunity will be required to submit a J40 Plan Development Proposal (described in Appendix L). Note that Applicants to this FOA are required to develop a Justice40 plan regardless of whether or not a project or work site is located within a disadvantaged community.

Community, Labor, and Stakeholder Engagement
For projects funded under all AOIs of this FOA, recipients will be required to develop an Engagement Plan. The Engagement Plan shall set forth the Applicant’s plans and actions to engage with relevant Tribes/Alaska Native Corporations (ANCs) and stakeholders, including labor unions, community-based organizations representing local residents and businesses, labor unions and worker organizations, local government, emergency responders, and communities with environmental justice concerns. Communities involve both local communities — towns, cities or counties in geographic proximity to a project and Tribes/ANCs in close proximity to a project — and potentially, broader groups which experience common conditions, which will need to be identified and scoped as part of the Engagement Plan. Community and labor engagement should lay the groundwork for the eventual negotiation of a Workforce and Community Agreement, which could take the form of one or more kinds of negotiated agreements with affected communities, such as Community Benefits Agreements, Project Labor Agreements, or others. Successful Applicants will demonstrate the ability to develop a plan that would meet the intent of meaningful tribal, community and stakeholder engagement.

Applicants are required to submit an Engagement Plan Development Proposal at time of application, which is described in Appendix L.

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 Project Director 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 – end date)
- The person-months of effort per year being 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 project period of performance of the award should circumstances change which impact the responses provided above.

The information may be provided in the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vita (SciENcv), a cooperative venture maintained at https://www.ncbi.nlm.nih.gov/sciencv/, and is also available at
https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.pdf. 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. If the NSF format is used, the individual must still include a signature, date, and a certification statement using the language included in the paragraph above.

Save the Current and Pending Support in a single PDF file using the following convention for the title “CPS.pdf” and click on “Add Optional Other Attachment” to attach.

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 relocate physically to the foreign state for the above purpose. Some programs allow for or encourage continued employment at U.S. 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.

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 DOE award.\footnote{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.}

xx. Intellectual Property Management Plan (IPMP) (if applicable)

Applicants must submit an executed IPMP between the members of the consortia or team.

The award will set forth the treatment of and obligations related to intellectual property rights between DOE and the individual members. The IPMP should describe how the members will handle intellectual property rights and issues between themselves while ensuring compliance with federal intellectual property laws, regulations, and policies (see Sections VIII.K.-VIII.N. of this FOA for more details on applicable federal intellectual property laws and regulations). Guidance regarding the contents of IPMP is available from DOE upon request.

The following is a non-exhaustive list of examples of items that the IPMP may cover:

- The treatment of confidential information between members (e.g., the use of NDAs);
- The treatment of background intellectual property (e.g., any requirements for identifying it or making it available);
- The treatment of inventions made under the award (e.g., any requirements for disclosing to the other members on an application, filing patent applications, paying for patent prosecution, and cross-licensing or other licensing arrangements between the members);
- The treatment of data produced, including software, under the award (e.g., any publication process or other dissemination strategies, copyrighting strategy or arrangement between members);
- Any technology transfer and commercialization requirements or arrangements between the members;
- The treatment of any intellectual property issues that may arise due to a change in membership of the consortia or team; and
- The handling of disputes related to intellectual property between the members.

Save the Intellectual Property Management Plan in a single PDF file using the following convention for the title “IPMP.pdf”.

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\footnote{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.}
xxi. **Locations of Work**
The applicant must complete the supplied template by listing the city, state, and zip code + 4 and State for each location where project work will be performed by the prime recipient or subrecipient(s). Save the Location of Work in a single Microsoft Excel file using the following naming convention for the title “LOW.xls or xlsx” and click on “Add Optional Other Attachment” to attach.

xxii. **Preliminary Environmental Volume**
The Applicant must submit an environmental volume providing for the work of the entire project. The environmental volume requirements are available at https://netl.doe.gov/sites/default/files/2018-02/451_1-1-6.pdf. Save the volume in a single file named "EV.pdf" and click on "Add Optional Other Attachment” to attach.

xxiii. **Environmental Questionnaire**
The Applicant must submit an environmental questionnaire providing for the work of Phase I. The Applicant is also responsible for submitting a separate environmental questionnaire for each proposed subrecipient performing at a different location. The environmental questionnaire is available at http://www.netl.doe.gov/File%20Library/Business/forms/451_1-1-3.pdf. Save the questionnaire in a single file named "Env.pdf" (or “Env-FILL IN TEAM MEMBER.pdf” if more than questionnaire is submitted) and click on "Add Optional Other Attachment” to attach.

NOTE: If selected for award and if a subrecipient’s location is not known at the time of application, a subsequent environmental questionnaire will be needed prior to them beginning work at an alternate location.

xxiv. **Technology Maturation Plan**
The Technology Maturation Plan (TMP) must not exceed 15 pages including cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) double spaced with font no smaller than 12-point. Applicants shall prepare the TMP in the format provided in Appendix K of this FOA. Save this plan in a single file named “TMP.pdf” and click on “Add Other Attachment” to attach.

xxv. **Project Management Plan**
The Project Management Plan (PMP) must not exceed 15 pages including cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) double spaced with font no smaller than 12-point. Applicants shall prepare the
PMP in the format provided in Appendix I of the FOA. Save this information in a file named "PMP.pdf," and click on "Add Optional Other Attachment" to attach.

xxvi. **Funding Plan (including cost share commitment letters and financial model)**

Applicants must present a viable plan to obtain funding for the entire non-DOE share of the total project cost in the form of a Funding Plan that identifies all sources of project funds. The Funding Plan shall be comprised of a Phase I Project Financing Plan and a Phase II Project Financing Plan. Appendix J describes in more detail what is required in the Funding Plan. Save this information in a file named "Funding Plan.pdf," and click on "Add Optional Other Attachment" to attach. Save the financial model in a file named "Model.xls or xlxs," and click on "Add Optional Other Attachment" to attach.

xxvii. **AACE Class 4 Pre-FEED Requirements (AOI-1 only)**

Applicants are required to submit the previously conducted AACE Class 4 Pre-FEED study (or the equivalent as described by the third sentence in the lead-in paragraph of Appendix A) as part of their full application. Submission of this study is required with the full application, and failure to submit the plan may result in rejection of the Applicant’s application without further consideration. Guidance for preparing the Pre-FEED study is provided in Appendix A of this FOA. Save this plan in a single file named “Pre-FEED.pdf” and click on “Add Other Attachment” to attach.

xxviii. **AACE Class 3 FEED Requirements (AOI-2 only)**

Applicants are required to submit the previously conducted AACE Class 3 FEED study (or the equivalent as described by the third sentence in the lead-in paragraph of Appendix B) as part of their full application. Submission of this study is required with the full application, and failure to submit the plan may result in rejection of the Applicant’s application without further consideration. Guidance for preparing the FEED study is provided in Appendix B of this FOA. Save this plan in a single file named “FEED.pdf” and click on “Add Other Attachment” to attach.

D. **Post Selection Information Requests**

If selected for award, DOE reserves the right to request additional or clarifying information regarding the following (non-exhaustive list):

- Personnel proposed to work on the project and collaborating organizations (See Section VI.B.xix. Participants and Collaborating Organizations);
- Current and Pending Support (See Sections IV.C.xix and VI.B.xx. Current and Pending Support);
- 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 VI.B.xi Intellectual Property Management Plan;
- Indirect cost information;
• Other budget information;
• Commitment Letters 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);
• Representation of Limited Rights Data and Restricted Software, if applicable;
• Information related to Davis-Bacon Act Requirements;
• Information related to Community Benefits Agreements, Good Neighbor Agreements, or other agreements Applicants may have made with the relevant community
• Environmental Questionnaire.
• Cybersecurity Plan, if applicable.

E. 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) Be registered in the SAM at https://www.sam.gov before submitting its application; (2) provide a valid UEI number in its application; and (3) continue to maintain an active SAM registration with current information at all times during which it 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, the 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.

F. Submission Dates and Times
All required submissions must be submitted as specifically stated in the announcement no later than the dates/times provided on the cover page of this FOA.

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

H. 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 Part 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 their 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 override 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 E 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.

v. Foreign Travel
If international travel is proposed for your project, please note that your organization must comply with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118), commonly referred to as the “Fly America Act,” and implementing regulations at 41 CFR 301-10.131 through 301-10.143. The law and regulations require air transport of people or property to, from, between, or within a country other than the United States, the cost of which is supported under this award, to be performed by or under a cost-sharing arrangement with a U.S. flag carrier, if service is available. Foreign travel costs are allowable only with the written prior approval of the Contracting Officer assigned to the award.

vi. Equipment and Supplies
Property disposition will 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. **Buy America Requirements for Infrastructure Projects**

Pursuant to the Build America Buy America Act, subtitle IX of BIL (Buy America), federally assisted projects that involve infrastructure work, undertaken by applicable recipient types, require that:

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

In general, whether a given project must apply this requirement is dependent on several factors, such as the recipient’s entity type, whether the work involves “infrastructure,” as that term is defined in Section 70914 of the BIL (discussed in more detail below), and whether the infrastructure in question is publicly owned or serves a public function.

For this FOA specifically, all projects subject to this FOA are considered “infrastructure” within the Buy America provision of BIL, based on implementation guidance from the Office of Management and Budget (OMB) issued on April 18, 2022. Moreover, based also on the OMB guidance, the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the requirements only apply to projects whose prime recipient is a “non-Federal entity,” e.g., a State, local government, Indian tribe, Institution of Higher Education, or nonprofit organization. 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. Finally, for all Applicants—both non-Federal entities and for-profit entities—DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the Applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

The cooperative agreement for funding between DOE and the awardee will require each recipient: (1) to fulfill the commitments made in its application regarding the procurement of U.S.-produced products, subject to a waiver process by DOE assessing the availability and cost (increasing the cost of the overall project by >25%) and (2) to fulfill the commitments made in its application regarding the procurement of other key component metals and manufactured products domestically that are deemed available in sufficient and reasonably available quantities or of a satisfactory quality at the time of award negotiation, again subject to a DOE waiver process. Applicants may also seek a DOE waiver of domestic procurement requirements based on applicable public interest factors, such as relating to minor components, international trade obligations, or other considerations.
Applicants are strongly encouraged to consult Appendix F 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.

viii. Davis-Bacon Act Requirements

Projects awarded under this FOA will be funded under Division D of the Bipartisan Infrastructure Law. 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, and 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 of 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 subcontracts or subrecipient awards.

(2) ensuring that if wage determination(s) and appropriate Davis-Bacon clauses and requirements are improperly omitted from contracts and subrecipient awards, the applicable wage determination(s) and clauses are retroactively incorporated to the start of performance.

(3) being responsible for compliance by any subcontractor or subrecipient with the Davis-Bacon labor standards.

(4) receiving and reviewing certified weekly payrolls submitted by all subcontractors and subrecipients for accuracy and to identify potential compliance issues.

(5) maintaining original certified weekly payrolls for 3 years after the completion of the project and must make those payrolls available to the DOE or the Department of Labor 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 subcontractors and subrecipients and as requested or directed by the DOE.

(7) cooperating with any authorized representative of the Department of Labor in their inspection of records, interviews with employees, and other actions undertaken as part of a Department of Labor investigation.

(8) posting in a prominent and accessible place the wage determination(s) and Department of Labor Publication: WH-1321, Notice to Employees Working on Federal or Federally Assisted Construction Projects.

(9) notifying the Contracting Officer of all labor standards issues, including all complaints regarding incorrect payment of prevailing wages and/or fringe benefits, received from the 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, 6, and 8 and as defined in FAR 52.222-14; disputed labor standards determinations; Department of Labor investigations; or legal or judicial proceedings related to the labor standards under this Contract, a subcontract, or subrecipient award.

(10) preparing and submitting to the 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. Form submittal will be administered through the iBenefits system (https://doebenefits2.energy.gov) or its successor system, or other manner of compliance as directed by the Contracting Officer.

Recipients of funding under this FOA will also be required to undergo Davis-Bacon Act compliance training and to maintain competency in Davis-Bacon Act compliance. The Contracting Officer will notify the recipient of any DOE sponsored Davis-Bacon Act compliance trainings. The U.S. Department of Labor (“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.

DOE anticipates entering into a contract with a third-party DBA electronic payroll compliance software application. Recipients of funding under this FOA should plan to ensure the timely electronic submission of weekly certified payrolls through the DOE vendor as part of its compliance with the Davis-Bacon Act unless a waiver is granted to a particular contractor or subcontractor because they are unable or limited in their ability to use or access the DOE vendor.

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.
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 Part 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 funds critical and emerging technology areas, DOE also considers possible vectors of undue foreign influence in evaluating risk. If high risks are identified and cannot be sufficiently mitigated, DOE may elect to not fund the Applicant.
xi. **Invoice Review and Approval**

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 Davis-Bacon 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 continuing 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 U.S. 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 federally assisted construction contracts exceeding $10,000 annually will be subject to the requirements of Executive Order 11246:

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.

The Department of Labor’s (DOL) Office of Federal Contractor Compliance Programs (OFCCP) uses a neutral process to schedule contractors for compliance evaluations. OFCCP’s Technical Assistance Guide should be consulted to gain an understanding of the requirements and possible actions the recipients, subrecipients, contractors and subcontractors must take.

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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: Scientific and Technological Merit (31%)

This criterion involves consideration of the following factors:

- Adequacy of the description of the proposed effort and degree to which the proposed effort meets the stated objectives of the FOA and the relevant AOI.
- Degree to which the proposed design addresses mandatory and desirable attributes of an REE Demonstration Facility, including attributes regarding plant size; individually separated product purity, quantity and type; schedule; CO$_2$ emissions; management of produced waste products; and environmental liability mitigations (e.g., AMD, mine waste, and other deleterious material).
- Degree to which the Applicant demonstrates that the preliminary business case, and the technical, economic, and environmental feasibility of the potential host site(s) identified within the application are appropriate for a vertically integrated REE Demonstration Facility as described in this FOA.
- Degree to which the Applicant demonstrates with supporting data that the scale and siting strategy (i.e., retrofit, brownfield, bluefield, greenfield) selected for Phase I is appropriate as the next logical step in the technology development including the feasibility and cost effectiveness of the next logical development step.
- Degree to which the Applicant demonstrates that previous technology development (e.g., equipment and circuit validation) and previously completed design work, when supplemented by the proposed design development activities, will provide a sufficient basis to commence work on Phase I of the REE Demonstration Facility.
- (a) Degree to which the Applicant requires any further research and design development (for process optimization, integration, and de-risking) and (b) the necessity of the planned research and design development (for process optimization, integration, and de-risking).
- Soundness of the proposed REE Demonstration Facility design basis as specified by the appropriate AACE Class cost estimate and schedule guidelines in meeting the requirements of the relevant AOI, including
preliminary process flow diagrams (PFDs), equipment descriptions, and mass and energy balances around each major process unit and the total plant. Includes the degree to which the Applicant identifies and considers all necessary major equipment, evidence that operating costs have been considered in adequate detail, reasonableness of the preliminary capital and operating cost estimates, and reasonableness of the preliminary schedule.

- (Phase I – AOI-2 only) The level and extent to which Applicant has successfully completed Phase I (AACE Class 3 front end engineering design (FEED) study as specified by Appendix B) prior to application submittal.
- Readiness of the technology for a REE Demonstration Facility (defined as the last step of Research & Development prior to commercial-scale demonstration and deployment). Includes demonstrated success of the proposed technology at meeting relevant performance metrics in an operating small pilot-scale and/or pilot-scale facilities. Also includes the depth and quality of the Applicant’s understanding of the remaining challenges, capacity to resolve potential known as well as unforeseen challenges, and the need for demonstration and/or validation of the proposed technology at an operating demonstration-scale facility.
- The adequacy and completeness of the Technology Maturation Plan (TMP) in describing the state of the proposed technology and defining both the TRL of the individual circuits and the integration of the circuits at the beginning of the project and the anticipated TRL at the end of the project.
- (Phase I – AOI-1 only) As described in the Technical Volume using the Table 1 (Estimate Input Checklist and Maturity Matrix for AOI-1) template provided in the FOA, the thoroughness and completeness of the Applicant’s 1) current maturity of the AACE Class 4 Classification (FOA Appendix A) at the time of Phase I application and 2) planned maturity of the AACE Class 3 Classification (Appendix B) at the end of Phase I.
- (Phase I – AOI-2 only) As described in the Project Narrative using the Table 2 (Estimate Input Checklist and Maturity Matrix for AOI-2) template provided in the FOA, the thoroughness and completeness of the Applicant’s 1) current maturity of the AACE Class 3 Classification (FOA Appendix B) at the time of Phase I application and 2) planned maturity of the AACE Class 3 Classification (Appendix B) at the end of Phase I.

**Criterion 2: Technical Approach and Understanding (22%)**
This criterion involves consideration of the following factors:
- Adequacy and feasibility of the Applicant’s approach to achieving the goal of technical readiness level (TRL 8) at the end of Phase II. This includes, but is not limited to, the reasonableness of the approach for the following Phase I activities: plans and schedule for host site selection; updates of preliminary capital and operating cost estimates and schedule for design,
construction, and operation; identification of FEED partner and execution of plan for FEED study; and obtaining NEPA approval and other regulatory/permitting issues.

- Feasibility, appropriateness, rationale, and completeness of the proposed SOPO, such that there is a logical progression of Phase I work and a clear path forward toward meeting the goals and objectives of the FOA and the relevant AOI.

- The adequacy and completeness of the Project Management Plan (PMP) in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken if these baselines must be revised; and identification of project risks and strategies for mitigation, such as a written contingency plan (construction contingencies only allowed in Phase II). This includes the completeness and reasonableness of the Milestone Log, Success Criteria at Decision Points, Funding and Costing Profiles, and an appropriate Resource-Loaded Schedule including an appropriately detailed work breakdown structure as addressed by the AACE cost code requirements with respect to the SOPO, FOA objectives, and FOA Specific Requirements.

- (Phase I - AOI-1 only) Feasibility and soundness of the description of the proposed effort and approach to complete Phase I. This includes but is not limited to the completeness of the Applicant’s plan to define all aspects of project design, construction, handover from engineering to operations, and operations to support an informed DOE decision regarding future potential activities targeting the execution of the proposed REE Demonstration Facility.

- Soundness of the description of the proposed effort and approach, including but not limited to completing the investment case (such as establishing investment scenarios, market applicability, economic advantages that establish competitiveness of the concept, and utility and provision to identified supply chains, including where the Applicant integrates produced materials into the supply chains, etc.) for the REE Demonstration Facility as provided in the AACE Class 4 Feasibility Study (AOI-1) or AACE Class 3 Feed Study (AOI-2) documentation.

- The adequacy and completeness of the proposed approach for costing and ensuring the benign operation of the REE Demonstration Facility and the tracking, quantification, and management of produced waste products (including, but not limited to, wastewater control, radioactive material handling, etc.) and other potential environmental impacts.

**Criterion 3: Technical and Management Capabilities (27%)**

This criterion involves consideration of the following factors:

- Demonstrated experience of the Applicant and partnering organizations in managing projects of similar size, scope, and complexity. This includes the
credentials, capabilities, and experience of key personnel and partnering organizations to perform the work, in order to produce MREOs/MRESs, CMM, REMs, etc. at the quantities, purities and schedule as identified in this FOA, bringing the Phase I project to a successful conclusion.

- Appropriateness and extent of credentials, capabilities, and experience with respect to the work outlined in the Technical Approach across all circuits addressed in the application and to be performed by the key personnel and partnering organizations (e.g., partners, sub-recipients, consultants, students, etc.) bringing the Phase I project to a successful conclusion.

- Strength of the proposed project team, or the Applicant’s plan to form a project team, capable of executing the construction and operation of a demonstration facility in Phase II. This shall include but not be limited to the inclusion of the appropriate team members with experience in process design, building, and operating commercial mineral processing plants. Specifically, experience in mineral extraction of REE-CM and reduction to metals technology should be substantiated. Also includes the experience and participation of all relevant partners, including the feedstock supplier(s), facility host site and/or satellite locations owner(s), original equipment manufacturers, and architectural engineers (including procurement and construction management); depth and clarity of the discussion regarding potential obstacles (e.g., technical, financial, legal) to successful team formation; and evidence of interest (i.e., Letters of Commitment from critical stakeholders (i.e., supply chain, financial investors, etc.) and/or other team members).

- Strength of the evidence that the organization(s) carrying out the work (e.g., FEED study, site selection/EV documentation, permitting, and investment case) is committed to carrying out the proposed work. Includes strength of commitment of all partnering organizations and/or team members.

- Clarity, logic, and likely effectiveness of the project organization to successfully complete the project, taking into account roles and responsibilities concerning task assignments, communication, and monitoring and controlling project scope, cost, schedule, and risk. Extent to which the roles, responsibilities, and availability of each team member and key personnel have been delineated.

- Adequacy and availability of proposed personnel, facilities, equipment, and resource materials to perform project tasks in Phase I.

- Adequacy and technical, economic, and environmental feasibility for the host site(s) and/or satellite locations identified within the application. Suitability of the proposed host site(s) and/or satellite locations (including existing facilities) to host the REE Demonstration Facility, and feasibility of the plan to qualify and secure the host site and/or satellite locations within Phase I of a potential project. This includes the ability to obtain and gather
the necessary information and data to demonstrate the likelihood of successfully completing the EA or EIS process for the host site and/or satellite locations. Evidence that the Applicant will be able to secure access for the life of the project to a suitable site(s) for the proposed project. Includes the Applicant’s understanding of site(s) requirements including technical, regulatory, permitting, and environmental issues, appropriateness of proposed site(s) (e.g., access to transportation infrastructure and utilities meeting facility requirements), and indications of support from owners of any proposed host site(s).

Criterion 4: Community Benefits Plan (20%)

Community Benefits Plan components - Quality Jobs Plan; Diversity, Equity, Inclusion and Accessibility (DEIA) Plan; J40 Plan Development Proposal; and Community, Labor, and Stakeholder Engagement (Engagement) Plan Development Proposal. Requirements described in Appendix L.

Overall Approach

a. Project viability and social risk mitigation. The extent to which Applicant’s Community Benefits Plan illustrates project viability and social risk mitigation through community and labor engagement; investment in the American workforce; diversity, equity, inclusion and accessibility, and “Justice40 Initiative” benefits to disadvantaged communities.

b. Quality. Adequacy of response to the plans/assessment and extent to which plans provided are thorough and include measurable actions to advance goals and meet requirements as defined within each plan/assessment.

c. Support. Extent to which impacted communities are appropriately included as core partners in the project and/or affirm support.

d. Agreements. The extent the actions outlined in the Community Benefits Plan are supported by existing Workforce and Community Agreements (e.g., good neighbor agreements, workforce agreements, project labor agreements, collective bargaining agreements, and similar agreements).

e. Community Benefits Plan Team and Resources. Extent to which the team and resources are capable of adequately implementing plans.

f. Integration. Adequacy and completeness of integrating the community benefits plans into key project management documents, such as the Project Management Plan, including project milestone(s) that evaluate progress of plan implementation; managing project performance relative to the plans; and defining actions and mitigation strategies to revise the plans; to successfully implement the plans.

g. Influence. Extent to which the plans and key project management documents provide mechanisms that enable impacts to project direction in a
timely manner based on the outcomes and findings of societal considerations and impact work.

**h. Above and Beyond.** Extent in which the project includes analysis, technology development, and/or engagement efforts that address community desires and/or concerns which go above and beyond the requirements for technical, analytical, performance, or regulatory compliance.

**i. Previous efforts/lessons learned.** Extent in which lessons learned, from previous societal considerations and impact work, are documented and integrated into future work.

**Community and Labor Engagement**
- Extent to which the Applicant demonstrates community and labor engagement to date and/or a clear and appropriately robust plan to engage local stakeholders, including labor unions and community-based organizations that support or work with disadvantaged communities.

**Job Quality**
- Extent to which Community Benefits Plan demonstrates that the jobs supported by the proposed project will be quality jobs and provides a robust and credible plan to attract, train, and retain skilled workers. The bullets include examples of how this could be demonstrated—
  - Collective bargaining agreement, project labor agreement, labor management partnership, labor peace or labor neutrality agreement, or similar agreement or commitment to workers’ free and fair choice to join a union or labor organization of their choosing; and
  - Commitments to fair wages, benefits, or other worker support, including education and training and worker engagement in workplace safety and health plans.

**Diversity, Equity, Inclusion, and Accessibility**
- Extent to which the Community Benefits Plan includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures; partnerships with workforce training or support organizations serving workers facing systematic barriers to employment; and other DEIA commitments.

**Justice40 Initiative**
- Extent to which the Community Benefits Plan identifies: specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated; and
• Extent to which the project would contribute to meeting the objective that 40% of the overall benefits of climate and clean energy investments flow to disadvantaged communities.

Financial Evaluation Criteria

The financial evaluation of the funding plan, which is not point scored, will be conducted to determine the following:

• Adequacy, completeness, and viability of the proposed Phase II Project Financing Plan.
• Financial condition and capacity of proposed funding sources to provide their portion of project costs, including development costs and potential cost overruns.
• Reasonableness and completeness of the plan, including a financing schedule, demonstrating the potential for the Applicant to successfully implement the project.
• Completeness of financial information and consistency with the funding and financial business plans and with other application materials.
• Viability of financial projections in the financial model to attract investors and lenders.
• Degree of financial commitment to the project evidenced by Applicant and other project parties.

The Selection Official will consider the results of this evaluation when making selections. Failure to adequately demonstrate financial capability in this plan alone may result in non-selection regardless of all other technical and nontechnical factors.

Budget Information Evaluation Criteria

The budget evaluation, which is not point scored, will be conducted to determine the following:

• Reasonableness, allowability, and allocation of the proposed Phase I cost and cost share.
• Completeness and adequacy of the supporting documentation for the cost estimate.
• The proposed budget aligns with the SOPO tasks (i.e., same format by Phase, task, etc.).
• Correspondence between the Phase I SOPO and budget and adequacy of associated supporting documentation.
• Correspondence between the budget estimate and the magnitude of the
work proposed.

The Selection Official may consider the results of this evaluation when making selections.

**Environmental Evaluation Criteria**

The environmental evaluation, which is not point scored, will be conducted as follows. The Environmental Questionnaire(s) and Environmental Volume will be evaluated to: (1) determine the adequacy and completeness of information submitted; (2) assess the Applicant’s awareness of project-related requirements, including requirements for mitigating any project-related environmental risks and impacts; (3) assess the Applicant’s ability to meet compliance requirements and the Applicant’s approach to identification and resolution of issues; and (4) assess the potential impacts of the proposed work and the potential liability to DOE. The Questionnaire and Volume will be used to assist DOE in partially fulfilling requirements for compliance with NEPA and for making a preliminary assessment regarding the level of analysis necessary to comply with NEPA.

The Selection Official may consider the results of this evaluation when making selections.

**B. Standards for Application Evaluation**


**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:

- It may be desirable to select for award a project, or group of projects, that represent a diversity of technologies or feedstocks under this FOA.
- It may be desirable to select for award a project, or group of projects, with a broad or specific geographic distribution under this FOA.
- It may be desirable to select a project, or group of projects, if such a selection will optimize use of available funds.
• It may be desirable to select a project, or group of projects, if such a selection presents lesser schedule risk, lesser budget risk, lesser technical risk, lesser societal considerations and impacts risk, and/or lesser environmental risks. Environmental risk includes, but is not limited to, an adverse impact to air, soil, water, or increase in overall cradle-to-grave greenhouse gas footprint (carbon dioxide equivalent, CO\textsubscript{2}e).
• It may be desirable to select for award a project, or group of projects, that leverage existing public-private partnerships and/or Federal resources.
• It may be desirable to select for award a project, or group of projects, with a higher level of industry involvement and demonstrated ability to accelerate commercialization and overcome key market barriers.
• The extent the proposed project advances the Administration’s critical minerals strategy as laid out by the 100-day and 1-year reviews/reports from Executive Order 14017.
• It may be desirable to select for award a project that is likely to lead to increased high-quality employment and manufacturing in the United States.
• It may be desirable to select for award a project, or group of projects, that will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty.
• It may be desirable to select for award a project, or group of projects, that incorporates Applicant or team members from Minority Serving Institutions (e.g., Historically Black Colleges and Universities (HBCUs)/Other Minority Serving Institutions); and partnerships with Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or tribal nations.
• It may be desirable to select for award a project, or group of projects, when compared to the existing DOE project portfolio and other projects to be selected from the subject FOA, contributes to the total portfolio meeting the goals reflected in the Community Benefits Plan criteria.
• The extent the proposed project will employ procurement of U.S. iron, steel, manufactured products, and construction materials.

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, 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 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.

DOE may obtain additional information through Pre-Selection Interviews that will be used to make a final selection determination. DOE may select applications for funding and make awards without Pre-Selection Interviews. 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 Integrity and Performance Matters

DOE, prior to making a federal award with a total amount of federal share greater than the simplified acquisition threshold, is required to review and consider any information about the Applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313).
The Applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM.

DOE will consider any written comments by the Applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the Applicant's integrity, business ethics, and record of performance under federal awards when completing the review of risk posed by Applicants 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, the amount of funds available in arriving at selections for this FOA, and other factors as indicated in 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. 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 Grants.gov. 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. Successful Applicants
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. Applicants do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the prime recipient in FedConnect.

The award negotiation process will take approximately 60 days. Applicants must designate a primary and a backup point-of-contact in Grants.gov 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.H.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. As an alternate, 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 one-time actions before submitting an application in response to this FOA, and it is vital that Applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an Applicant’s ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected. These requirements are as follows:

1. System for Award Management
Register with the SAM at https://www.sam.gov. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called a Marketing Partner ID Number (MPIN) are important steps in SAM registration. Please update your SAM registration annually.

2. FedConnect
Register in FedConnect at https://www.fedconnect.net. To create an organization account, your organization’s SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf.

3. Grants.gov
Register in Grants.gov (https://www.grants.gov/) to receive automatic updates when Amendments to this FOA are posted.

You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Full Applications submitted via e-mail will not be accepted.

Grants.gov Applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different webforms within an application. For each funding opportunity announcement (FOA), you can create individual instances of a workspace.
Below is an overview of submitting an application using Workspace on Grants.gov. For access to complete instructions on how to apply for opportunities using Workspace, refer to:

1) **Create a Workspace**: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.

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

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

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

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

   c. **Complete SF-424 Fields First**: The forms are designed to fill in common required fields across other forms, such as the Applicant name, address, and DUNS Number. Once it is completed, the information will transfer to the other forms.

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

4) **Track a Workspace Submission**: After successfully submitting a workspace application, a Grants.gov Tracking Number (GRANTXXXXXXX) is automatically assigned to the application. The number will be listed on the Confirmation page that is generated after submission. Using the tracking number, access the Track My Application page under the Applicants tab or the Details tab in the submitted workspace.
For additional training resources, including video tutorials, refer to:
https://www.grants.gov/web/grants/applicants/applicant-training.html

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

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

4. **Full Application Proof of Timely Submissions**
Proof of timely submission is automatically recorded by Grants.gov. An electronic date/time stamp is generated within the system when the application is successfully received by Grants.gov. The Applicant with the AOR role who submitted the application will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. The Applicant with the AOR role will also receive the official date/time stamp and Grants.gov Tracking number in an email serving as proof of their timely submission. The Grants.gov Support Center reports that some Applicants end the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application.

When DOE successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgment of receipt of the application to the email address of the Applicant with the AOR role who submitted the application. Again, proof of timely submission shall be the official date and time that Grants.gov receives your application. Applications received by Grants.gov after the established due date for the FOA will be considered non-compliant.

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 Grants.gov and FedConnect.net, 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 (September 2021)**
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, will 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 who is not a United States citizen by birth or naturalization. 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.

Approval for foreign nationals from countries identified on the U.S. Department of State’s list of State Sponsors of Terrorism must be obtained from DOE before they can participate in the performance of any work under an award.

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](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](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.
vii. **Flood Resilience**
Applications should indicate whether the proposed project location(s) is within a floodplain, how the floodplain was defined, and how future flooding will factor into the project’s design. The base floodplain long used for planning has been the 100-year floodplain, that is, a floodplain with a 1.0 percent chance of flooding in any given year. As directed by Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (2015), Federal agencies, including DOE, continue to avoid development in a floodplain to the extent possible. When doing so is not possible, Federal agencies are directed 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 percent annual flood change (500-year floodplain). Executive Order 13690 and related information is available at [https://www.energy.gov/nepa/articles/eo-13690-establishing-federal-flood-risk-management-standard-and-process-further](https://www.energy.gov/nepa/articles/eo-13690-establishing-federal-flood-risk-management-standard-and-process-further).

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 in response 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 the following definitions apply:

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

In submitting an application in response 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:

   (1) "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."

   (2) The limitation above shall not contravene requirements applicable to Standard Form 312 Classified Information Nondisclosure Agreement [https://fas.org/sgp/othergov/sf312.pdf](https://fas.org/sgp/othergov/sf312.pdf), Form 4414 Sensitive Compartmented Information Disclosure Agreement [https://fas.org/sgp/othergov/intel/sf4414.pdf](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.

   (3) 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 United States government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.
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 as a whole. Substantial involvement includes, but is not limited to, the following:

**Recipient’s Responsibilities.** The Recipient is responsible for:

- Performing the activities supported by this award in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services;
- Managing and controlling project activities in accordance with established processes and procedures to ensure tasks and subtasks are completed within schedule and budget constraints defined by the current Project Management Plan;
- Implementing an approach to identify, analyze, and respond to project risks that is commensurate with the complexity of the project;
- Defining and revising approaches and plans, submitting the plans to DOE for review, and incorporating DOE comments;
- Coordinating related project activities with subrecipients and external suppliers, including contractors, to ensure effective integration of all work elements;
- Attending annual project review meetings and reporting project status;
- Participating in peer review evaluations of the project, or peer review evaluations of the program that their project supports;
- Submitting technical reports and publicly releasable documents that incorporate DOE comments; and
- Presenting the project results at appropriate technical conferences or meetings as directed by the DOE Project Officer.
- Submitting sample materials to DOE-NETL of REE and CMM products produced during conduct of this FOA (if generated); and
- Submitting materials characterization information to DOE-NETL for public release in NETL’s Energy Data eXchange (EDX) website.
DOE Responsibilities. DOE is responsible for:

- Reviewing in a timely manner project plans, including project management, testing and technology transfer plans, and recommending alternate approaches, if the plans do not address critical programmatic issues;
- Participating in project management planning activities, including risk analysis, to ensure DOE’s program requirements or limitations are considered in performance of the work elements;
- Conducting annual project review meetings to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches or shifting work emphasis, if needed;
- Providing substantial involvement to ensure that project results address critical system and programmatic goals established by the DOE Office of Fossil Energy and Carbon Management, in coordination with DOE’s Critical Minerals Sustainability program;
- Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications;
- Serving as scientific/technical liaison between awardees and other program or industry staff; and
- Reviewing and concurring with ongoing technical performance to ensure that adequate progress has been obtained.

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 ten (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 their 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.


xiii. Reporting
Reporting requirements are identified on the Federal Assistance Reporting Checklist and Instructions, DOE F 4600.2, attached to the award agreement. A sample checklist is available at [https://www.netl.doe.gov/sites/default/files/netl-file/4600.2-FE.pdf](https://www.netl.doe.gov/sites/default/files/netl-file/4600.2-FE.pdf).
Additional reporting requirements apply to projects funded by BIL. As part of tracking progress toward key departmental goals – ensuring justice and equity, investing in the American workforce, boosting domestic manufacturing, reducing greenhouse gas emissions, and advancing a pathway to private sector – DOE may require specific data collection. Examples of data that may be collected include:

- New manufacturing production, and recycling capacity
- Number of trainings completed, trainees placed in full-time employment, workforce partnerships involving employers, community-based organizations, or labor unions.
  - Justice and Equity data, including:
    - Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses and Veteran Owned Businesses acting as vendors and sub-
    contractors for bids on supplies, services and equipment.
    - Value, number, and type of partnerships with MSIs
    - Stakeholder engagement events, consent-based siting activities
    - 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 (IP) Generation and IP 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 actually 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; and (8) written approval of the continuation application by the Contracting Officer.

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43 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
Project(s) selected under this FOA will have Go/No-Go decision points incorporated into the SOPO as appropriate to ensure that projects meet certain criteria prior to proceeding beyond the Go/No-Go point. Go/No-Go decision points may include effective implementation of social considerations and impacts plans, or incorporate DOE review of the Community Benefits Plan Progress Report (see Appendix L). Go/No-Go decision points will be proposed at the discretion of the Applicant but will be determined during award negotiation.

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.

**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 United States government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States government would otherwise exceed $20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

**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 $1,000,000, the recipient or subrecipient must:

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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.

A description of any planned changes from the SOPO and/or Milestone Summary Table.
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. Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty

States, local governments, or other public entities may not condition sub-awards in a manner that would discriminate, or disadvantage sub-recipients based on their religious character.

xviii. 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 collaborating organizations within 30 days after the Applicant is notified of the selection. 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.

xix. 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.C.xix.

xx. 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 U.S. industry and labor. Therefore, in exchange for receiving taxpayer dollars to support an Applicant’s project, the Applicant must agree to a U.S. Competitiveness provision requiring 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, at any time in which an entity cannot meet the requirements of the U.S. Competitiveness Provision, the entity may request a modification or waiver of the U.S. Competitiveness Provision. For example, the entity may propose modifying the language of the U.S. Competitiveness Provision in order to change the scope of the requirements or to provide more specifics on the application of the requirements for a particular technology. As another example, the entity may request that the U.S. Competitiveness Provision be waived in lieu of a net benefits statement or U.S. manufacturing plan. The statement or plan would contain specific and enforceable commitments that would be beneficial to the U.S. economy and competitiveness. Examples of such commitments could include manufacturing specific products in the U.S., making a specific investment in a new or existing U.S. manufacturing facility, keeping certain activities based in the U.S. or supporting a certain number of jobs in the U.S. related to the technology. If DOE, in its sole discretion, determines that the proposed modification or waiver promotes commercialization and provides substantial U.S. economic benefits, DOE may grant the request and, if granted, modify the award terms and conditions for the requesting entity accordingly.


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.

xxi. **Interim Conflict of Interest Policy for Financial Assistance**

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy)\(^{44}\) is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial

\(^{44}\) DOE’s interim COI Policy can be found at https://www.energy.gov/sites/default/files/2021-12/Interim%20COI%20Policy%20FAL2022-02%20to%20SPFs.pdf.
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 their 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.

xxii. 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 (currently FAPIIS). 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.

xxiii. 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.

Federal regulation and the DOE Order require review by an Institutional Review Board (IRB) of all proposed human subjects research projects. The IRB is an interdisciplinary ethics board responsible for ensuring that the proposed research is sound and justifies the use of human subjects or their data; the potential risks to human subjects have been minimized; participation is voluntary; and clear and accurate information about the study, the benefits and risks of participating, and how individuals’ data/specimens will be protected/used, is provided to potential participants for their use in determining whether or not to participate.

The recipient shall provide the Federal Wide Assurance number identified in item 1) below and the certification identified in item 2) below to DOE prior to initiation of any project that will involve interactions with humans in some way (e.g., through surveys); analysis of their identifiable data (e.g., demographic data and energy use over time); asking individuals to test devices, products, or materials developed through research; and/or testing of commercially available devices in buildings/homes in which humans will be present. Note: This list of examples is illustrative and not all inclusive.

No DOE funded research activity involving human subjects, biospecimens, or identifiable private information shall be conducted without:

1) A registration and a Federal Wide Assurance of compliance accepted by the Office of Human Research Protection (OHRP) in the Department of Health and Human Services; and

2) Certification that the research has been reviewed and approved by an Institutional Review Board (IRB) provided for in the assurance. IRB review may be accomplished by the awardee’s institutional IRB; by the Central DOE IRB; or if collaborating with one of the DOE national laboratories, by the DOE national laboratory IRB.
The recipient is responsible for ensuring all subrecipients comply and for reporting information on the project annually to the DOE Human Subjects Research Database (HSRD) at https://science.osti.gov/HumanSubjects/Human-Subjects-Database/home. Note: If a DOE IRB is used, no end of year reporting will be needed.

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).

xxiv. Indemnity
Awards resulting from this FOA will contain the following provision reminding Recipients of DOE’s rights of indemnification.

The Recipient shall indemnify the Government and its officers, agents, or employees for any and all liability, including litigation expenses and attorneys’ fees, arising from suits, actions, or claims of any character for death, bodily injury, or loss of or damage to property or to the environment, resulting from the project, except to the extent that such liability results from the direct fault or negligence of Government officers, agents or employees, or to the extent such liability may be covered by applicable allowable costs provisions.

C. Program Down-Select
Only Phase I Recipients that have successfully completed all Phase I activities and requirements will be afforded the opportunity to submit a renewal application for Phases II for consideration under the competitive, down-selection process outlined in this FOA. In addition to the Go/No-Go Reviews required for each project, recipients will present their projects to DOE individually (not to other recipients). Subject matter experts from academia, national laboratories, and industry may be used as reviewers, subject to conflict of interest and non-disclosure considerations.

For successful Phase I awardees intending to participate in the Phase II process, a Renewal Application will be required to be submitted. Renewal Applications are requests for additional funding for a period subsequent to that provided by a current award. DOE will evaluate the Renewal Applications against established criteria as part of a competitive process. Detailed information on the Renewal Application requirements, submission procedure, and evaluation criteria will be provided in the cooperative agreement for the Phase I awards.

Upon completion of the competitive project review (down-selection process), DOE intends to select one award (competitively down-selected) to receive federal funding beyond Phase I. As a result of this down-select process, certain projects will not receive federal funding beyond Phase I even if the project is meeting the pre-defined metrics.

NOTE: For Phase I awardees not selected by DOE for a Phase II award, all Phase I and final deliverables will be due at the end of Phase I in accordance with the instructions in the award’s Reporting Requirements Checklist and Statement of Project Objectives.
VII. Questions/Agency Contacts

A. QUESTIONS

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 as described below. **Specifically, all questions regarding this FOA and/or the informational webinar must be submitted through the FedConnect portal.** You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. Applicants are encouraged to review previously issued Questions and Answers prior to the submission of questions. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions and comments concerning this FOA shall be submitted not later than 3 business days prior to the application due date. Questions submitted after that date may not allow the Government sufficient time to respond. 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 the FedConnect portal at: [https://www.FedConnect.net](https://www.FedConnect.net). DOE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE/NNSA cannot answer these questions.

B. AGENCY CONTACT

<table>
<thead>
<tr>
<th>Name:</th>
<th>Angela Bosley</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail:</td>
<td><a href="mailto:Angela.Bosley@netl.doe.gov">Angela.Bosley@netl.doe.gov</a></td>
</tr>
</tbody>
</table>
VIII. Other Information

A. FOA Modifications
Amendments to this FOA will be posted on the Grants.gov system and the FedConnect portal. However, you will only receive an email when an amendment or a FOA is posted on these sites by registering with FedConnect as an interested party for this FOA. DOE recommends that you register as soon after the release of the 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 business sensitive (e.g., commercial or financial information that is privileged or confidential), trade secrets, 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 business sensitive, trade secrets, proprietary, or otherwise confidential information, it is furnished to the Federal Government (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 Government’s right to use the information if it is obtained from another source.

If an applicant chooses to submit business sensitive, trade secrets, 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 business sensitive, trade secrets, 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 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 business sensitive, trade secrets, proprietary, or otherwise confidential information:

Notice of Restriction on Disclosure and Use of Data:
Pages [list applicable pages] of this document may contain business sensitive, trade secrets, 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 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 business sensitive, trade secrets, proprietary, or otherwise confidential information must be marked as follows: “Contains Business Sensitive, Trade Secrets, 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 which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.
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 termination of award negotiations;
- The modification, suspension, and/or termination 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. In order 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: For an Applicant not covered by a Class Patent Waiver or the Bayh-Dole Act, the Applicant 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 sub-awards, 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](https://www.energy.gov/gc/determination-exceptional-circumstances-decs). Pursuant to 37 CFR § 401.4, any nonprofit organization or small business firm as defined by 35 U.S.C. 201 affected by any DEC has the right to appeal it by providing written notice to DOE within 30 working days from the time it receives a copy of the determination.

- DOE may issue and publish on the website above further DECs 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 and subrecipients 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 contractors doing work on behalf of the government.

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

For this FOA, the funding program may determine that an extended period of protection (more than five years and not to exceed thirty years) is reasonably required for commercialization and will apply to certain categories of data first produced under the resulting awards in accordance with 15 U.S.C. § 3710a(c)(7)(B)(ii), the Energy Policy Acts of 1992 and 2005, and the Energy Act of 2020. Information regarding the categories of data and period of protection will be provided during the negotiation process.

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 violations related to the project funded under the DOE award, 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; 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).


P. Personally Identifiable Information (PII)

All information provided by the Applicant must to the greatest extent possible exclude PII. The term “PII” refers to information which can be used to distinguish or trace an individual’s identity, such as their name, social security number, biometric records, alone, or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother’s maiden name. (See OMB Memorandum M-07-16 dated May 22, 2007, found at: https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2007/m07-16.pdf

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 of 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, non-profit 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, then 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.
APPENDIX A – AACE CLASS 4 PRE-FEED REQUIREMENTS (AOI-1)

Research data will be provided with the Application to prove proposed processes. Identify sources of all data provided (e.g., literature versus field experience). Alternative equivalent estimates and documentation to AACE Class 4 requirements are acceptable provided the Applicant clearly identifies the equivalent data and presents it in the format in this Appendix.

Design Criteria

- Facility(ies) or system(s) will produce at least 1-3 t per day of mixed rare earth oxides or rare earth salts (MREOs/MRESs) at a minimum concentration of 75% MREO/MRES by weight (preferred 98wt% or greater) subsequently processed to individual or binary separated REOs or RESs at >90% concentration by weight, culminating in the production of market-grade REMs (generally 99.9% by weight or greater, pending supply chain specifications).

- Facility(ies) or system(s) consisting of one or more circuit(s) (potentially mobile), which could include, but not be limited to:
  1. Feedstock Concentration (FC) focused on maximizing or otherwise optimizing the degree of physical separation (i.e., beneficiation), as needed, in order to initially concentrate rare earths and minerals at or near the location of feedstocks to economize the cost of transporting raw feedstocks and chemicals required to achieve the specified product quality. Such a circuit may include existing, commercially available technologies for mineral/solid material concentration such as flotation, density separation, electrostatic separation, magnetic separation, and the like to produce sufficient quantities of enriched feedstock per day at the required size to feed a chemical extraction facility and is able to respond to local feedstock composition changes;
  2. Chemical Extraction and Purification (CEP) circuit potentially utilizing the FC circuit as feed, to extract the REEs and produce a MREO or MRES stream (identified as MREO/MRES) of at least 75% MREO/MRES concentrate by weight (preferred 98wt% or greater). Such a circuit is envisioned to include proven processes/technologies such as acid (e.g., sulfuric, nitric, hydrochloric, etc.) leaching, precipitation, solid-liquid separations, and the like to produce at least 1-3 t per day of product;
  3. Production of Individually Separated High Purity (ISHP) Rare Earth Oxides/Rare Earth Salts (REO/RES) circuit, utilizing the CEP circuit, to produce ISHP materials.
  4. Production of High Purity Rare Earth Metals (REM) circuit, utilizing the ISHP circuit, to produce high purity individual or binary REM systems (i.e., Nd, Pr, NdPr, etc.), as well as co-production of critical minerals and materials (CMM) if economically feasible.

- The facility(ies)/system(s) can be new construction; repurposing, modification, or extension of existing or idled facilities; or a combination of these options and be environmentally benign;

- The circuit(s) is envisioned to utilize conventional technologies (including technologies that may have been
commercially deployed for another application) or technologies that will be ready for deployment in a demonstration facility with only limited design development and/or R&D activities;

- The geographic configuration may include, but not be limited to, any of the following:
  1. All circuits co-located at one vertically integrated location; or
  2. Circuits located at a combination of process locations with the circuits providing for the separation of REO and/or RES and refining into REMs at a single site;

- Feedstock materials shall, initially, be available in sufficient quantity to operate the system for a minimum of five years and consist of acid mine drainage (AMD), mine waste, or other deleterious material of adequate quantity from which the MREO/MRES product can be extracted;
  o Newly-mined coal and recycled materials (e.g., hard drives, fluorescent lightbulbs, etc.) are NOT OF INTEREST to this solicitation.

- The overall facility may be feedstock flexible in that one or a combination of the above resources (AMD, mine waste or other deleterious material) can be used to functionally operate the facility to produce the MREOs/MRESs;

- All circuits shall operate in an environmentally benign manner; in other words, in compliance of all federal, state, and local laws and regulations with respect to emissions and waste treatment and disposal;

- The produced MREOs/MRESs shall contain both heavy rare earth elements (HREEs) and light rare earth elements (LREEs), with a focus on REEs for production of commodity, clean energy, and defense-related products.

**General Requirements**

- Pre-FEED (also known as a Feasibility study) study sufficient to support an AACE Class 4 cost estimate. The study shall also include designs and cost estimates for taking the MREOs/MRESs produced and generating individually separated REOs/RESs, and subsequently individual and/or binary REMs, at greater than 99% concentration by weight, with potential production of individual and/or binary REMs at higher purities to reflect required supply chain specifications.

The technologies to be considered do not require commercial performance guarantees. The plant designs are projected to include commercial and pre-commercial plant components that may require additional R&D. Firms are encouraged to have broad teaming arrangements that engage Engineering, Procurement, and Construction or Architectural and Engineering (EPC or A/E) firms, equipment manufacturers, technology developers and/or end users in determining component options. Teams shall include at least one member with industry experience related to extraction and/or separation of minerals or metals, purification of minerals or metals, and/or marketing and sales of CMM or metals.

MREO/MRES facility configurations may consider options or configurations for the feedstock and other fuel and/or
process chemical handling units or system components. Options or configurations for the circuits may be considered (e.g., but not be limited to: froth floatation, hydrophilic/hydrophobic separation, etc. for a FC circuit; as well as roasters, acid leaching designs, ionic liquids, or other extraction processes for a CEP circuit) that have been validated for incorporation into the MREO/MRES facility.

Document Delivery Requirements

Normal text will be typed using 12-point Times New Roman font, with 1-1/2 line spacing.

Pre-FEED Study

The pre-defined design package (Pre-Feed Study) to prove the technical and economic feasibility of the facility concept/configuration proposed to achieve the design criteria of this requirement.

DOE encourages broad teaming arrangements that engage EPC or A/E firms, equipment manufacturers, technology developers, and/or end-users in determining component options detailed in the developed cases.

Pre-FEED Study Content Requirements

Each pre-FEED Study will focus on performance, cost, location, feedstock type, etc. of associated facility. Unrelated designs and technologies (aside from those that immediately follow) should not be considered. The Pre-FEED Study is to process the MREO/MRES into individually separated REOs/RESS (within the United States (US)), at concentrations greater than or equal to 99% concentration by weight, and subsequently into individual REMs (also within the United States), at greater than 99% concentration by weight. Additionally, critical minerals and materials (CMM) may be considered to be produced. In that case, the CMM that may be concentrated in any of the process steps should be listed, even if they are disposed as waste as part of the project. The concentration and phase of the produced CMM will be dependent on supply chain and market needs.

To obtain consistent performance and cost estimates, pre-FEED studies shall be based on AACE International Recommended Practice No. 18R-97 Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries. The following pre-Feed areas are to be included in the report and should be based on a nominal AACE Class 4 Estimate Classification:

a. MREO/MRES and CM, Individual separation, and Reduction to metals production facility scope description

b. Facility production/capacity, including product concentrations and volumes/quantities of MREO/MRES circuit/facility, Individual separation circuit/facility, Reduction to metals circuit/facility, and CMM circuit/facility (if separate from other circuits)

c. Approximate facility location(s)

d. Project code of accounts

e. Facility and component system descriptions
f. Facility performance summary  
g. Heat and material balances  
h. Water balances  
i. Chemical balances  
j. Steady state emissions data  
k. Facility auxiliary load summaries  
l. Overall block flow diagram  
m. Process flow diagrams  
n. Equipment summary showing which pieces are commercial and which will require R&D  
o. Waste Stream Management summary  
p. Estimated cost to complete an AACE Class 3 FEED study (on the fully integrated system: MREO/MRES production, individual separation, reduction to metal(s), and CMM)  
q. Assessment of available data for commercial equipment and vendor contacts as needed  
r. Technology gap analysis for non-commercial equipment/components of the facility to quantify the performance advances and cost reductions needed to allow the facility to meet the projected performance detailed in the pre-Feed analysis  
s. Assessment of modularization potential – the degree to which modularization (e.g., off-site fabrication of equipment or subsystems, or laydown area preassembly, in whole or part) and associated construction time and/or cost savings may apply to a plant of the identified size.

The pre-Feed Study shall be performed in a manner consistent with AACE guidelines. It is required that the geographic location, resource type, applicable environmental regulations, etc., will be defined and cost parameters (year of estimate basis, financing assumptions, etc.) will be consistent with the information provided in REE Prices section of this appendix. The capital and O&M costs shall be reported at a level of detail similar to that found in AACE Class 4 guidelines. The estimated accuracy of the cost estimates should be explicitly stated.

Pre-Feed Study Requirements

Required documents for the pre-Feed Study are provided in the table below. These documents are intended to define the pre-Feed Study. Details and requirements associated with these documents are listed in the pre-Feed Study Content Requirements table below.

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Document Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Basis Report</td>
<td>A description of the facility that includes MREO/MRES separation into individual REO/RES and reduction to metals and CMM, a compilation of salient design assumptions, including but not limited to: plant capacity, feedstock type and composition, site characteristics, environmental targets, equipment performance targets, and selected flexibility traits and targets (including final product concentrations and quantities for each circuit and specifications for feed to each circuit).</td>
</tr>
<tr>
<td>Performance Results Report</td>
<td>A summary of key process performance parameters, including but not limited to: Plant input (for each circuit, including feed specifications), plant output (for each circuit), plant auxiliary loads, net plant efficiency (relative to REO/RES extraction), chemical consumption, and environmental performance.</td>
</tr>
<tr>
<td>Technology Gap Analysis</td>
<td>An inventory of plant components that are commercially available and plant components that require additional development, if applicable. A development pathway should be provided for components requiring additional development.</td>
</tr>
<tr>
<td>Cost Results Report</td>
<td>The estimated capital and operating costs of the plant will be provided at a level of detail commensurate with AACE Class 4 Guidelines. The costs of each circuit (i.e., production of MREO/MRES, separation and concentration to individual and/or binary REO or RES, reduction to metals, and CMM production) should be discernable in the overall costs.</td>
</tr>
<tr>
<td>Project Execution Plan Presentation</td>
<td>A description of a project timeline that culminates in a detailed design for the facility and includes all necessary steps such as project partnerships (e.g., an off-take agreement or Letter of Intent (LOI)/Support from one or more potential off-takers to purchase high purity rare earth and/or other CMM, etc.), non-commercial component development, site selection, permitting, and detailed design.</td>
</tr>
<tr>
<td>Greenhouse Gas (GHG) Life Cycle Analysis (LCA) Report</td>
<td>A description of greenhouse gas emissions resulting from each material, energy and operation required to extract, transport, refine, and produce the final marketed product(s), inclusive of any additional co-products produced by the process.</td>
</tr>
<tr>
<td>Final Feasibility Case Study Report</td>
<td>A compilation of the design basis, performance results, cost results, technology gap analysis, and lifecycle analysis that addresses all comments received on the individual sections.</td>
</tr>
</tbody>
</table>

The documents will be assembled in a report titled “Production of Rare Earth Products and Critical Minerals and Materials at an Engineering Prototype-Scale”. Content requirements for these documents are defined as follows:
| Cover Page | The cover page should include: a title for the fully integrated Rare Earth Production Facility that best describes its features, the estimated rare earth product output quantity (pounds or metric tons per hour) and concentration (percentage by weight), specific feedstock quantities and concentrations, and any statements regarding confidentiality. |
| Concept Background | Based on the facility including Individual separation, Reduction to Metals, and CMM processing circuits, including: |
| | • Rare Earth Production Facility scope description |
| | • Plant production/facility capacity |
| | • Plant/module location(s) |
| | • Business case from conceptual design and any additions for new circuit(s) |
| Process Description | • The proposed plant including its basic operating principles and how it is unique and innovative.  
• Description regarding the ability of the plant to meet the specific design criteria, as well as ability to produce individually separated high purity REOs/RESs, rare earth metals (REMs), and CMM. If specific criteria can’t be met, or are cost prohibitive to meet, discussion shall include details on how they would be overcome.  
• The proposed technology’s target level of performance including:  
  o Expected plant efficiency range (relative to MREO/MRES extraction, individual separation, and reduction to metals and feedstock variability)  
  o Waste stream/Emissions control summary  
• Brief description of system including:  
  o Size of the commercial offering  
  o Advanced technology aspects  
  o List of components that are not commercially available  
• Brief description of each process block  
• Extent and manner of use of acid mine drainage, coal waste or other deleterious material  
If required in the facility, provide:  
• Chemical Extraction working fluid/chemical and process conditions  
• Features that minimize chemical consumption  
• Techniques to reduce design, construction, and commissioning schedules from conventional norms including:  
  o Modularization potential and characteristics (e.g., off-site fabrication of equipment or subsystems, or laydown area pre-assembly, in whole or part)  
  o Parametric design  
  o Advanced process engineering  
Provide graphs, charts, or other data to supplement plant description. |
<table>
<thead>
<tr>
<th>Report Type</th>
<th>Report Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design Basis Report and Final Report</strong></td>
<td>The design basis report shall include:                                                                ------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
|                                 |  - Site characteristics  
|                                 |  - Feedstock type and composition  
|                                 |  - Flexible plant performance targets  
|                                 |  - Chemical requirements  
|                                 |  - System size basis  
|                                 |  - Environmental targets  
|                                 |  - Projected plant efficiency (relative to REE extraction, individual separation, and reduction to metals)  
|                                 |  - Major equipment performance assumptions  |
| **Performance Results Report and Final Report** |  - Performance Model  
|                                 |  - Plant performance summary (including input into each processing circuit and whether or not there is flexibility in the feed specifications, MREO/MRES output into the individual separation circuit, individually separated REO/RES output into reduction to metals circuit, and individual REM and CMM output, auxiliary loads, and other relevant data)  
|                                 |  - Heat and material balances (including process flow diagram with numbered major streams and corresponding mass and energy balance table)  
|                                 |  - Chemical balances (including chemical demand, internal recycle, chemical consumption, and chemical makeup requirements)  
|                                 |  - Steady state emissions data (for all criteria pollutants and CO\textsubscript{2})  
|                                 |  - Equipment summary showing which pieces are commercial and which will require R&D  
|                                 |  - Assessment of available data for commercial equipment and vendor contacts as needed  |
| **Cost Results Report and Final Report** |  - Description of cost estimating methodology  
|                                 |  - Reference plant capital and operating costs at baseline conditions at a level of detail commensurate with AACE Class 4 guidelines  
|                                 |  - Project O&M costs for the range of flexibility conditions  
<p>|                                 |  - Estimated required selling price of product(s) and applicable sensitivity analysis results based on the technology concept and required design criteria  |</p>
<table>
<thead>
<tr>
<th>Technology Gap Analysis and Final Report</th>
<th>Technology Gap Analysis and Commercial Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The current state-of-the-art in the relevant field and application, including key shortcomings, limitations, and challenges;</td>
<td></td>
</tr>
<tr>
<td>• How the proposed plant will overcome the shortcomings, limitations, and challenges in the relevant field and application;</td>
<td></td>
</tr>
<tr>
<td>• The key technical risks/issues associated with the proposed plant, and mitigations to overcome them;</td>
<td></td>
</tr>
<tr>
<td>• A detailed risk assessment and mitigation plan;</td>
<td></td>
</tr>
<tr>
<td>• Perceived technology gaps; and</td>
<td></td>
</tr>
<tr>
<td>• Development pathway description for the plant that will overcome key technical risks/issues, including need for and size of a commercial system.</td>
<td></td>
</tr>
</tbody>
</table>

Identify and describe the key technology OEMs, including

• List of commercial equipment
• List of equipment requiring R&D
• Describe whether the EPC or A/E firm has worked with the OEMs of the proposed equipment, and if so, briefly describe prior work
• Whether the EPC or A/E firm has adequate access to information on the equipment included in the proposed concept
| Greenhouse Gas (GHG) Life Cycle Analysis (LCA) Report | Life Cycle Analysis (LCA) | The LCA shall be conducted and documented for the proposed process for producing MREO/MRES product. The LCA shall model only the proposed system. The goal of the LCA is to understand the greenhouse gas (GHG) contributions from each material input, energy input, and operation from extraction through production of the final marketed REM materials (referred to as a cradle-to-gate analysis; excludes use of the REM into the final product and the use and end of life of the final product. The scope of the LCA is limited to GHG emissions for all material and energy inputs and operations that contribute greater than 1% to the total life cycle GHG profile. LCA report template and other resources can be found at www.netl.doe.gov/LCA/CO2U. Note, only the REM production process of interest shall be modeled (Proposed System). No comparative system is required to be modeled, as described in the NETL LCA CO2U Guidance Toolkit. The global warming potential shall be reported in both 100-year (primary reporting metric) and 20-year time-horizons using the International Panel on Climate Change’s Fifth Assessment Report (AR5) values with climate carbon feedback. For reference, the 100-year global warming potential value for fossil methane is 36. See the NETL CO2U LCA Guidance document for additional details: www.netl.doe.gov/LCA/CO2U The LCA results shall include a contribution analysis, sensitivity analysis of key parameters, discussion of data limitations and recommendations for improving the life cycle greenhouse gas performance of the proposed system. LCA report deliverable shall include the LCA model for DOE review. Use of any third-party licensed data shall include permission for DOE review access. NETL default life cycle inventory data for common energy inputs are available within the CO2U LCA openLCA database and NETL LCA website at www.netl.doe.gov/LCA. |
| Final Report | Business Case | • Market scenario including, but not limited to:
  - Feedstock resources utilized in the system
    - Include projections of feedstock reserves and feasibility of operating a minimum of 5 years with existing reserve.
    - Include characterization of the projected feedstock(s).
  - REE (and CMM produced) price(s)
  - Permitting
  - Mineral rights engagement
  - Host site engagement
  - Cost for all waste treatment required |
<table>
<thead>
<tr>
<th>Project Execution Plan Presentation and Final Report (Appendix)</th>
<th>Project Execution Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>A description of a project timeline that culminates in a detailed design for the project facility and includes:</td>
<td></td>
</tr>
<tr>
<td>• Non-commercial component development</td>
<td></td>
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<tr>
<td>• Project financing</td>
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<tr>
<td>• Site selection</td>
<td></td>
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<tr>
<td>• Partnering with technology providers and off-takers</td>
<td></td>
</tr>
<tr>
<td>• Permitting</td>
<td></td>
</tr>
<tr>
<td>• Detailed design</td>
<td></td>
</tr>
</tbody>
</table>
**REE Prices**

A list of simplified market prices for all salable Rare Earth Element (REEs) are listed in Table 3 below. Listed prices do not represent spot prices for the various materials and are for analysis purposes only. REEs are not commodities and therefore accurate pricing is hard to come by and can be highly variable depending on current supply and demand forecasts. Prices in Table 3 should be used to eliminate variability and simplify economic analyses. All product price assumptions used in economic analyses that deviate from Table 3 should be justified. Market prices for additional products not listed in Table 3 should be reported.

<table>
<thead>
<tr>
<th>LIGHT RARE EARTH METALS</th>
<th>US$/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanthanum metal ≥ 99%</td>
<td>5</td>
</tr>
<tr>
<td>Lanthanum Oxide ≥ 99.5%</td>
<td>2</td>
</tr>
<tr>
<td>Cerium metal ≥ 99%</td>
<td>5</td>
</tr>
<tr>
<td>Cerium Oxide ≥ 99.5%</td>
<td>2</td>
</tr>
<tr>
<td>Praseodymium metal ≥ 99%</td>
<td>93</td>
</tr>
<tr>
<td>Praseodymium Oxide ≥ 99.5%</td>
<td>50</td>
</tr>
<tr>
<td>Neodymium metal ≥ 99.5%</td>
<td>55</td>
</tr>
<tr>
<td>Neodymium Oxide ≥ 99.5%</td>
<td>42</td>
</tr>
<tr>
<td>Samarium metal ≥ 99.9%</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEAVY RARE EARTH METALS</th>
<th>US$/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europium Oxide ≥ 99.99%</td>
<td>30</td>
</tr>
<tr>
<td>Gadolinium metal 99.9%</td>
<td>50</td>
</tr>
<tr>
<td>Gadolinium Oxide ≥ 99.5%</td>
<td>23</td>
</tr>
<tr>
<td>Terbium metal ≥ 99.9%</td>
<td>650</td>
</tr>
<tr>
<td>Terbium Oxide ≥ 99.5%</td>
<td>500</td>
</tr>
<tr>
<td>Dysprosium metal ≥ 99%</td>
<td>300</td>
</tr>
<tr>
<td>Dysprosium Oxide ≥ 99.5%</td>
<td>250</td>
</tr>
<tr>
<td>Erbium metal ≥ 99.9%</td>
<td>95</td>
</tr>
<tr>
<td>Erbium Oxide ≥ 99.5%</td>
<td>22</td>
</tr>
<tr>
<td>Yttrium metal ≥ 99.9%</td>
<td>35</td>
</tr>
<tr>
<td>Yttrium Oxide ≥ 99.99%</td>
<td>6</td>
</tr>
<tr>
<td>Scandium metal 99.9%</td>
<td>3,500.00</td>
</tr>
<tr>
<td>Scandium Oxide ≥ 99.95%</td>
<td>1,000.00</td>
</tr>
<tr>
<td>Mischmetal ≥ 99%</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: mineralprices.com
Global Economic Assumptions

To simplify forecasting, a standard escalation rate of 3% can be applied to the cost of all consumables and products in the economic analysis. Suggested global economic assumptions are listed in Table 4.

<table>
<thead>
<tr>
<th>Table 4: Global Economic Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
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<tr>
<td><strong>TAXES</strong></td>
</tr>
<tr>
<td>Income Tax Rate</td>
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<tr>
<td>Capital Depreciation</td>
</tr>
<tr>
<td>Investment Tax Credit</td>
</tr>
<tr>
<td>Tax Holiday</td>
</tr>
<tr>
<td><strong>CONTRACTING AND FINANCING TERMS</strong></td>
</tr>
<tr>
<td>Type of Debt Financing</td>
</tr>
<tr>
<td>Repayment Term of Debt</td>
</tr>
<tr>
<td>Grace Period on Debt Repayment</td>
</tr>
<tr>
<td>Debt Reserve Fund</td>
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<tr>
<td><strong>ANALYSIS TIME PERIODS</strong></td>
</tr>
<tr>
<td>Capital Expenditure Period</td>
</tr>
<tr>
<td>Operational Period</td>
</tr>
<tr>
<td>Economic Analysis Period (used for IRROE)</td>
</tr>
<tr>
<td><strong>TREATMENT OF CAPITAL COSTS</strong></td>
</tr>
<tr>
<td>Capital Cost Escalation During Capital Expenditure Period (nominal annual rate)</td>
</tr>
<tr>
<td>Distribution of Total Overnight Capital over the Capital Expenditure Period (before escalation)</td>
</tr>
<tr>
<td>Working Capital</td>
</tr>
<tr>
<td>% of Total Overnight Capital that is Depreciated</td>
</tr>
<tr>
<td><strong>ESCALATION OF OPERATING REVENUES AND COSTS</strong></td>
</tr>
<tr>
<td>Escalation of Product Price (revenue), O&amp;M Costs, Fuel Costs (nominal annual rate)</td>
</tr>
<tr>
<td><strong>EXAMPLE FINANCING SCENARIO</strong></td>
</tr>
<tr>
<td>Debt/Equity Ratio</td>
</tr>
<tr>
<td>Internal Rate of Return on Equity (IRROE)</td>
</tr>
<tr>
<td>Interest Rate</td>
</tr>
</tbody>
</table>

¹ A nominal average annual rate of 3.6% is assumed for escalation of capital costs during construction. This rate is equivalent to the nominal average annual escalation rate for process plant construction costs between 1947 and 2008 according to the Chemical Engineering Plant Cost Index.

² An average annual inflation rate of 3.0% is assumed. This rate is equivalent to the average annual escalation rate between 1947 and 2008 for the U.S. Department of Labor’s Producer Price Index for Finished Goods, the so-called “headline” index of the various Producer Price Indices. (The Producer Price Index for the Electric Power Generation Industry may be more applicable, but that data does not provide a long-term historical perspective since it only dates back to December 2003.)
APPENDIX B – AACE CLASS 3 FEED REQUIREMENTS

Research data shall be provided with the Application to prove proposed processes. Identify sources of all data provided (e.g., literature versus field experience). For initial application submission of AOI-2 only, alternative equivalent estimates and documentation to AACE Class 3 requirements are acceptable provided the Applicant clearly identifies the equivalent data and presents it in the format in this Appendix.

As part of Phase I deliverables for AOI-1 and AOI-2, the (AOI-1) FEED study or (AOI-2) modifications or additions, as needed, to FEED study will be achieved as a requirement to down-select to Phase II. For AOI-2 only, if no modifications or additions are needed to meet the Phase I FEED study deliverable requirements, alternative equivalent estimates and documentation to AACE Class 3 requirements are acceptable provided the Applicant clearly identifies the equivalent data and presents it in the format in this Appendix.

Design Criteria

- Facility(ies) or system(s) shall produce at least 1-3 t per day of mixed rare earth oxides or rare earth salts (MREOs/MRESs) at a minimum concentration of 75% MREO/MRES by weight (preferred 98wt% or greater) subsequently processed to individual or binary separated REOs or RESs at >90% concentration by weight, culminating in the production of market-grade REMs (generally 99.9% by weight or greater, pending supply chain specifications).

- Facility(ies) or system(s) consisting of one or more circuit(s) (potentially mobile), which could include, but not be limited to:
  1. Feedstock Concentration (FC) focused on maximizing or otherwise optimizing the degree of physical separation (i.e., beneficiation) as needed in order to initially concentrate rare earths and minerals at or near the location of acid mine drainage, mine waste, or other deleterious material feedstocks to minimize the cost of transporting raw feedstocks and chemicals required to achieve the specified product quality. Such a circuit may include existing, commercially available technologies for mineral/solid material concentration such as flotation, density separation, electrostatic separation, magnetic separation, and the like to produce sufficient quantities of enriched feedstock per day at the required size to feed a chemical extraction facility and is able to respond to local feedstock composition changes;
  2. Chemical Extraction and Purification (CEP) circuit, potentially utilizing the FC circuit as feed, to extract the REEs and produce a MREO or MRES stream (identified as MREO/MRES) of at least 75% MREO/MRES concentrate by weight (preferred 98wt% or greater). Such a circuit is envisioned to include proven processes/technologies such as acid (e.g., sulfuric, nitric, hydrochloric, etc.) leaching, precipitation, solid-liquid separations, and the like to produce sufficient quantities of enriched feedstock per day at the required size to feed a chemical extraction facility and is able to respond to local feedstock composition changes;
  3. Production of Individually Separated High Purity (ISHP) Rare Earth Oxides/Rare Earth Salts (REO/RES) module, utilizing the CEP circuit, to produce ISHP materials.
  4. Production of High Purity Rare Earth Metals (REM) circuit, utilizing the ISHP circuit, to produce high purity (e.g., 99.0wt% - 99.99wt%; purities required by supply chain specifications) individual or binary REM systems (i.e., Nd, Pr, NdPr, etc.), as well as co-production of critical minerals and materials (CMM) if
• The facility(ies)/system(s) can be new construction; repurposing, modification, or extension of existing or idled facilities; or a combination of these options and be environmentally benign;

• The circuit(s) is envisioned to utilize conventional technologies (including technologies that may have been commercially deployed for another application) or technologies that are ready for deployment in a demonstration-scale facility with only limited design development and/or R&D activities that are limited or focused in scope to customization, de-risking, and/or optimization for integration of circuit(s);

• The geographic configuration may include, but not be limited to, any of the following:
  1. All circuits co-located at one vertically-integrated location; or
  2. Circuits located at a combination of process locations with the circuits providing for the separation of REO and/or RES and refining into REM at purities required by supply chain specifications at a single site;

• Feedstock materials shall, initially, be available in sufficient quantity to operate the system for a minimum of five years and consist of acid mine drainage (AMD), mine waste, or other deleterious material of adequate quantity from which the MREO/MRES product can be extracted;
  o Newly-mined coal and recycled materials (e.g., hard drives, fluorescent lightbulbs, etc.) are NOT OF INTEREST to this solicitation.

• The overall facility may be feedstock flexible in that one or a combination of the above resources (AMD, mine waste or other deleterious material) can be used to functionally operate the facility to produce the MREOs/MRESs;

• All circuits shall operate in an environmentally benign manner; in other words, in compliance of all federal, state, and local laws and regulations with respect to emissions and waste treatment and disposal;

• The produced MREOs/MRESs shall contain both heavy rare earth elements (HREEs) and light rare earth elements (LREEs), with a focus on REEs for production of commodity, clean energy, and defense-related products.

**General Requirements**

• FEED study sufficient to support an AACE Class 3 cost estimate. The study shall include designs and cost estimates for taking the MREOs/MRESs produced and generating individually separated REOs/RESs, and subsequently individual and/or binary rare earth metals (REMs), at greater than 99% concentration by weight, with potential production of individual and/or binary REMs at higher purities to reflect required supply chain specifications.

The technologies to be considered do not require commercial performance guarantees. The plant designs are projected to include commercial and pre-commercial plant components that require little to no R&D. Firms are encouraged to have broad teaming arrangements that engage Engineering, Procurement, and Construction or Architectural and Engineering (EPC or A/E) firms, equipment manufacturers, technology developers, and/or end users
in determining component options. Teams will include at least one member with industry experience related to extraction and/or separation of minerals or metals, purification of minerals or metals, and/or marketing and sales of CMM or metals. Teams shall additionally include supply chain manufacturers and end-users who support production of intermediate and/or end-use products containing REMs.

MREO/MRES facility configurations may consider options or configurations for the feedstock and other fuel and/or process chemical handling units or system components. Options or configurations for the circuits may be considered (e.g., but not limited to: froth floatation, hydrophilic/hydrophobic separation, etc. for a FC circuit; as well as roasters, acid leaching designs, ionic liquids, or other extraction processes for a CEP circuit) that have been validated for incorporation into the MREO/MRES facility.

Document Delivery Requirements

Normal text will be typed using 12-point Times New Roman font, with 1-1/2 line spacing.

FEED Study

The FEED Study to prove the technical and economic feasibility of the facility configuration proposed to achieve the design criteria of this requirement.

DOE encourages broad teaming arrangements that engage EPC or A/E firms, equipment manufacturers, technology developers, and/or end-users in determining component options detailed in the developed cases.

FEED Study Content Requirements

Each FEED Study will focus on performance, cost, location, feedstock type, etc., of the associated facility. Unrelated facility designs and technologies (aside from those that immediately follow) should not be considered. The FEED Study will focus on the production of MREO/MRES, processing the MREO/MRES into individually separated REOs and/or RESs (within the United States) at concentrations greater than or equal to 90% concentration by weight, with subsequent processing into individual and/or binary REMs (also within the United States), at greater than 99% concentration by weight with potential production of individual and/or binary REMs at higher purities to reflect supply chain specifications. Additionally, critical minerals and materials (CMM) may be considered to be produced. In that case, the CMs that may be concentrated in any of the process steps should be listed, even if they are disposed as waste as part of the project. The concentration and phase of the produced CMM will be dependent on supply chain and market needs.

To obtain consistent performance and cost estimates, FEED Studies shall be based on AACE International Recommended Practice No. 18R-97 Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries. The following areas (not all-inclusive) are to be included in the report and should be based on a nominal AACE Class 3 Estimate Classification:

General Project Data:

Defined Project Scope Description – All processes from feedstock acquisition to refining-to-metals production facility scope description.
**Defined** facility production/capacity, including product concentrations and volumes/quantities of MREO/MRES circuit/facility, the Individual separation circuit/facility, and the Reduction to metals circuit/facility, as well as the CMM circuit(s)/facility(ies) (if separate from other circuits)

**Specific** circuit/facility location(s)

**Defined Integrated Project Plan**

**Defined Project Master Schedule**

**Defined Escalation Strategy**

**Defined Work Breakdown Structure**

**Defined** project code of accounts

**Preliminary Contracting Strategy**

Assessment of modularization and/or turn-key potential – the degree to which modularization (e.g., off-site fabrication of equipment or subsystems, or laydown are preassembly, in whole or part) and associated construction time and/or cost savings may apply to a plant of the identified size.

**Engineering Deliverables:**

**Complete** Block Flow Diagrams

**Preliminary or Complete** Plot Plans

**Preliminary or Complete** Process Flow Diagrams (PFDs)

**Preliminary or Complete** Utility Flow Diagrams (UFDs)

**Preliminary or Complete** Piping & Instrumentation Diagrams (P&IDs)

**Preliminary or Complete** Heat & Material Balances

**Preliminary or Complete** Process Equipment List

**Preliminary or Complete** Utility Equipment List

**Preliminary or Complete** Electrical One-Line Drawings

**Preliminary or Complete** Specifications & Datasheets

**Preliminary or Complete** General Equipment Arrangement Drawings

**Started or Preliminary** Spare Parts Listing

**Started** Mechanical Discipline Drawings

**Started** Electrical Discipline Drawings

**Started** Instrumentation/Control System Discipline Drawings

**Started** Civil/Structural/Site Discipline Drawings

**Complete** Facility And Component System Descriptions

**Complete** Facility Performance Summary

**Complete** Water Balances

**Complete** Chemical Balances

**Complete** Steady State Emissions Data

**Complete** Facility Auxiliary Load Summaries

**Complete** Equipment Summary showing which pieces are commercial and which will require R&D

**Complete** Waste Stream Management Summary

**Complete** Assessment Of Available Data For Commercial Equipment And Vendor Contacts as needed

**Complete** Technology gap analysis for non-commercial equipment/components of the facility to quantify the performance advances and cost reductions needed to allow the facility to meet the projected performance detailed in the feasibility analysis

The FEED Study shall be performed in a manner consistent with AACE guidelines. It is required that the geographic location, resource type (AMD, mine waste or other deleterious material), applicable environmental regulations, etc., will be defined and cost parameters (year of estimate basis, financing assumptions, etc.) will be consistent with the information provided in **REE Prices** section of this appendix. The capital and O&M costs shall be reported at a level of detail similar to that found in AACE Class 3 guidelines. The estimated accuracy of the cost estimates should be explicitly stated.
### FEED Study Requirements

Required documents for the FEED Study are provided in the table below. These documents are intended to define the FEED Study. Details and requirements associated with these documents are listed in the FEED Study Content Requirements table below.

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Basis Report</td>
<td>A description of the facility that includes production of MREO/MRES, separation of MREO/MRES into individual REO/RES and reduction to individual and/or binary metals, and production of CMM; a compilation of salient design assumptions, including but not limited to: plant capacity, feedstock type, quantity, and composition, site characteristics, environmental targets, equipment performance targets, and selected flexibility traits and targets (including specifications for feed to each circuit; and final product concentrations and listing of additional trace and/or minor contaminants and quantities for each circuit).</td>
</tr>
<tr>
<td>Performance Results Report</td>
<td>A summary of key process performance parameters, including but not limited to: Plant input (for each circuit, including feed specifications), plant output (for each circuit), plant auxiliary loads, net plant efficiency (relative to MREO/MRES extraction, production of separated REO/RES and production of individual or binary REMs), chemical consumption, and environmental performance.</td>
</tr>
<tr>
<td>Technology Gap Analysis</td>
<td>An inventory of plant components that are commercially available and plant components that require additional development. A development pathway should be provided for components requiring additional development. Remaining gaps related to supply chain manufacturing specifications and annual demand will be addressed with a development pathway to produce marketable domestic products.</td>
</tr>
<tr>
<td>Cost Results Report</td>
<td>The estimated capital and operating (CAPEX and OPEX) costs of the plant shall be provided at a level of detail commensurate with AACE Class 3 Guidelines. The costs of each circuit (i.e., production of MREO/MRES, separation and concentration to individual REO or RES, reduction to metals producing individual and/or binary high purity metals, and CMM production) should be discernable in the overall costs.</td>
</tr>
<tr>
<td>Project Execution Plan Presentation</td>
<td>A description of a project timeline that culminates in a detailed design for the project and includes all necessary steps such as project partnerships (e.g., an off-take agreement or Letter of Intent/Support from one or more potential off-takers to purchase high purity rare earth and/or other CMM, etc.), non-commercial component development, site selection, permitting, and detailed design of each circuit of the demonstration facility.</td>
</tr>
<tr>
<td>Greenhouse Gas (GHG) Life Cycle Analysis (LCA) Report</td>
<td>A description of greenhouse gas emissions resulting from each material, energy and operation required to extract, transport, refine, and produce the final marketed REO/RES and/or REM and CMM product, inclusive of any additional co-products produced in each circuit of the demonstration facility.</td>
</tr>
</tbody>
</table>
The documents will be assembled in a report titled “Production of Rare Earth Products and Critical Minerals and Materials at a First-of-a-Kind Demonstration-Scale Facility Scale”. Content requirements for these documents are defined as follows:

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Page</td>
<td>The cover page should include: a title for the fully integrated Rare Earth Production Facility that best describes its features, the estimated rare earth product output quantity (pounds or metric tons per hour) and concentration (percentage by weight), specific feedstock quantities and concentrations, and any statements regarding confidentiality.</td>
</tr>
<tr>
<td>Concept</td>
<td>Based on the plant configuration including Individual Separation, Reduction to Metals, and CMM processing circuits, including:</td>
</tr>
<tr>
<td>Background</td>
<td>• Rare Earth Production Facility scope description</td>
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<tr>
<td></td>
<td>• Plant production/facility capacity</td>
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<tr>
<td></td>
<td>• Plant/circuit location(s)</td>
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<tr>
<td></td>
<td>• Business case from conceptual design and any additions for new circuit(s)</td>
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</tbody>
</table>
| Process Description | • The proposed plant configuration including its basic operating principles and how it is unique and innovative.  
• Description regarding the ability of the plant configuration to meet the specific design criteria for the production of MREO/MRES according to the intended supply chain specifications, as well as ability to produce individually separated high purity REOs/RESs, individual and/or binary rare earth metals (REMs), and CMM. If specific criteria can’t be met, or are cost prohibitive to meet, discussion shall include details on how the issue would be overcome.  
• The proposed technology’s target level of performance including:  
  o Expected plant efficiency range (relative to MREO/MRES extraction, individual separation, and reduction to metals and feedstock variability)  
  o Waste stream/emissions control summary including solid, (semi-solid, gels, sludges, eutectics, etc.,) liquid, gas and radioactive wastes.  
• Brief description of system including:  
  o Size of a commercial offering  
  o Advanced technology aspects  
  o List of components that are not commercially available  
• Brief description of each process circuit  
• Extent and manner of use of other feedstocks in conjunction with AMD, coal waste or other deleterious material resources  

If required in the facility, provide:  
• Chemical Extraction working fluid/chemical and process conditions (e.g., acids, ionic liquids, roasting, etc.)  
• Features that minimize chemical consumption  
• Techniques to reduce design, construction, and commissioning schedules from conventional norms including:  
  o Modularization potential and characteristics (e.g., off-site fabrication of equipment or subsystems, or laydown area pre-assembly, in whole or part)  
  o Parametric design  
  o Advanced process engineering  

Provide graphs, charts, or other data to supplement plant configuration description.
<table>
<thead>
<tr>
<th>Design Basis Report and Final Report</th>
<th>Design Basis</th>
<th>The design basis report shall include:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Site characteristics</td>
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<td></td>
<td></td>
<td>• Feedstock type, composition, quantity, and availability</td>
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<tr>
<td></td>
<td></td>
<td>• Flexible plant performance targets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Chemical requirements</td>
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<td></td>
<td></td>
<td>• Physical requirements (e.g., particle size)</td>
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<td></td>
<td></td>
<td>• System size basis</td>
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<td></td>
<td></td>
<td>• Environmental targets</td>
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<tr>
<td></td>
<td></td>
<td>• Projected plant efficiency (relative to REE extraction, individual separation, and reduction to metals; production of CMM)</td>
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<tr>
<td></td>
<td></td>
<td>• Major equipment performance assumptions</td>
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<tr>
<td></td>
<td></td>
<td>• List of potential supply chain specifications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Results Report and Final Report</th>
<th>Performance Results</th>
<th>• Performance Model including assumptions</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>• Plant performance summary (including input into each processing circuit and whether or not there is flexibility in the feed specifications, MREO/MRES production and use as a feed material into an individual separation circuit whereby individually separated REO/RES are produced and which are used as feed material for production of high purity metals in the reduction to metals circuit; production of individual CMM; auxiliary loads; other relevant data)</td>
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<td>• Heat and material balances (including process flow diagram with numbered major streams and corresponding mass and energy balance table)</td>
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<td></td>
<td></td>
<td>• Chemical balances (including chemical demand, internal recycle, chemical consumption, and chemical makeup requirements)</td>
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<td>• Steady state emissions data (for all criteria pollutants and CO₂)</td>
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<td></td>
<td></td>
<td>• Equipment summary showing which pieces are commercial and which will require customization and/or optimization for integration of circuit(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Assessment of available information for commercial equipment and vendor contacts as needed</td>
</tr>
<tr>
<td>Cost Results Report and Final Report</td>
<td>Cost Results</td>
<td></td>
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<tr>
<td>-------------------------------------</td>
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<td></td>
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<tr>
<td>• Description of cost estimating methodology</td>
<td></td>
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<tr>
<td>• Reference facility capital and operating costs at baseline conditions at a level of detail commensurate with AACE Class 3 guidelines</td>
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<tr>
<td>• Project annual O&amp;M costs for the range of operating conditions over the life of the facility</td>
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<tr>
<td>• Estimated required selling price of product(s) and applicable sensitivity analysis results based on the technology and required design criteria</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology Gap Analysis and Final Report</th>
<th>Technology Gap Analysis and Commercial Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The current state-of-the-art in the relevant field and application, including key shortcomings, limitations, and challenges;</td>
<td></td>
</tr>
<tr>
<td>• How the proposed plant will overcome the shortcomings, limitations, and challenges in the relevant field and application;</td>
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</tr>
<tr>
<td>• The key technical risks/issues associated with the proposed plant and mitigations to overcome them;</td>
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</tr>
<tr>
<td>• A detailed risk assessment and mitigation plan;</td>
<td></td>
</tr>
<tr>
<td>• Perceived technology gaps; and</td>
<td></td>
</tr>
<tr>
<td>• Development pathway description for the plant that will overcome key technical risks/issues, including need for and size of a commercial system.</td>
<td></td>
</tr>
</tbody>
</table>

Identify and describe the key technology OEMs, including

• List of commercial equipment

• List of equipment requiring customization and/or optimization for integration of circuit(s)

• Describe whether the EPC or A/E firm has worked with the OEMs of the proposed equipment, and if so, briefly describe prior work

• Whether the EPC or A/E firm has adequate access to information on the equipment included in the proposed facility
### Greenhouse Gas (GHG) Life Cycle Analysis (LCA) Report

The LCA shall be conducted and documented for the proposed process for producing the rare earth containing product. The LCA shall model only the proposed system. No comparison system is required. The goal of the LCA is to understand the greenhouse gas (GHG) contributions from each material input, energy input, and operation from extraction through production of the final marketed rare earth-containing product (referred to as a cradle-to-gate analysis; excludes use of the REO/RES into the final product and the use and end of life of the final product. The scope of the LCA is limited to GHG emissions for all material and energy inputs and operations that contribute greater than 1% to the total life cycle GHG profile. LCA report template and other resources can be found at [www.netl.doe.gov/LCA/CO2U](http://www.netl.doe.gov/LCA/CO2U). All individual REE-CM processing circuits shall be modeled, reflecting the REE Demonstration Facility as a complete system from feedstock through to the production of REMs and CMM. No comparative system is required to be modeled, as described in the NETL LCA CO2U Guidance Toolkit. The global warming potential shall be reported in both 100-year (primary reporting metric) and 20-year time-horizons using the International Panel on Climate Change’s Fifth Assessment Report (AR5) values with climate carbon feedback. For reference, the 100-year global warming potential value for fossil methane is 36. See the NETL CO2U LCA Guidance document for additional details: [www.netl.doe.gov/LCA/CO2U](http://www.netl.doe.gov/LCA/CO2U). The LCA results shall include a contribution analysis, sensitivity analysis of key parameters, discussion of data limitations and recommendations for improving the life cycle greenhouse gas performance of the proposed system. LCA report deliverable shall include the LCA model for DOE review. Use of any third-party licensed data shall include permission for DOE review access. NETL default life cycle inventory data for common energy inputs are available within the CO2U LCA openLCA database and NETL LCA website at [www.netl.doe.gov/LCA](http://www.netl.doe.gov/LCA).

### Final Report

**Business Case**

- Market scenario including, but not limited to:
  - Acid mine drainage (AMD), mine waste and other deleterious material utilized in the system, and other proposed feedstock(s)
    - Include projections of feedstock reserves and feasibility of operating a minimum of 5 years with existing reserve.
    - Include characterization of the projected feedstock(s).
  - REE (CMM as applicable) price(s)
  - Permitting
  - Mineral rights engagement
  - Host site engagement
  - Cost for all waste treatment required
| Domestic and/or international rare earth, and other by-products, market applicability |
| Market advantage of the facility |
| List of potential supply chains and manufacturing contacts |
| Market availability of chemicals and consumables |
| Estimated cost of rare earth products (MREOs/MRESs, individually separated REOs/RESs, and REMs, and CMM) and other ancillary products, if any, that establishes competitiveness of the concept |

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Execution Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>A description of a project timeline that culminates in a detailed design for the project concept and includes:</td>
</tr>
<tr>
<td></td>
<td>• Non-commercial component development</td>
</tr>
<tr>
<td></td>
<td>• Project financing</td>
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<tr>
<td></td>
<td>• Site selection</td>
</tr>
<tr>
<td></td>
<td>• Partnering with technology providers and off-takers</td>
</tr>
<tr>
<td></td>
<td>• Permitting</td>
</tr>
<tr>
<td></td>
<td>• Detailed design</td>
</tr>
</tbody>
</table>
REE Prices

A list of simplified market prices for all salable Rare Earth Elements (REEs) are listed in Table 5 below. Listed prices do not represent spot prices for the various materials and are for analysis purposes only. REEs are not commodities and therefore accurate pricing is hard to come by and can be highly variable depending on current supply and demand forecasts. Prices in Table 5 should be used to eliminate variability and simplify economic analyses. All product price assumptions used in economic analyses that deviate from Table 5 should be justified. Market prices for additional products not listed in Table 5 should be reported.

### Table 5: Simplified Estimated Market Prices (July 2022)

<table>
<thead>
<tr>
<th>LIGHT RARE EARTH METALS</th>
<th>US$/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanthanum metal ≥ 99%</td>
<td>5</td>
</tr>
<tr>
<td>Lanthanum Oxide ≥ 99.5%</td>
<td>1</td>
</tr>
<tr>
<td>Cerium metal ≥ 99%</td>
<td>5</td>
</tr>
<tr>
<td>Cerium Oxide ≥ 99.5%</td>
<td>1</td>
</tr>
<tr>
<td>Praseodymium metal ≥ 99%</td>
<td>150</td>
</tr>
<tr>
<td>Praseodymium Oxide ≥ 99.5%</td>
<td>100</td>
</tr>
<tr>
<td>Neodymium metal ≥ 99.5%</td>
<td>150</td>
</tr>
<tr>
<td>Neodymium Oxide ≥ 99.5%</td>
<td>125</td>
</tr>
<tr>
<td>Samarium metal ≥ 99.9%</td>
<td>15</td>
</tr>
<tr>
<td>Samarium oxide ≥ 99.9%</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEAVY RARE EARTH METALS</th>
<th>US$/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europium Metal ≥ 99.9%</td>
<td>200</td>
</tr>
<tr>
<td>Europium Oxide ≥ 99.99%</td>
<td>30</td>
</tr>
<tr>
<td>Gadolinium metal 99.9%</td>
<td>100</td>
</tr>
<tr>
<td>Gadolinium Oxide ≥ 99.5%</td>
<td>50</td>
</tr>
<tr>
<td>Terbium metal ≥ 99.9%</td>
<td>2,000</td>
</tr>
<tr>
<td>Terbium Oxide ≥ 99.5%</td>
<td>1,000</td>
</tr>
<tr>
<td>Dysprosium metal ≥ 99%</td>
<td>400</td>
</tr>
<tr>
<td>Dysprosium Oxide ≥ 99.5%</td>
<td>300</td>
</tr>
<tr>
<td>Erbium metal ≥ 99.9%</td>
<td>500</td>
</tr>
<tr>
<td>Erbium Oxide ≥ 99.5%</td>
<td>50</td>
</tr>
<tr>
<td>Yttrium metal ≥ 99.9%</td>
<td>40</td>
</tr>
<tr>
<td>Yttrium Oxide ≥ 99.99%</td>
<td>10</td>
</tr>
<tr>
<td>Scandium metal 99.9%</td>
<td>5,000</td>
</tr>
<tr>
<td>Scandium Oxide ≥ 99.95%</td>
<td>2,000</td>
</tr>
<tr>
<td>Mischmetal ≥ 99%</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: [https://mineralprices.com/#rar](https://mineralprices.com/#rar)
Global Economic Assumptions

To simplify forecasting, a standard escalation rate of 3% can be applied to the cost of all consumables and products in the economic analysis. Suggested global economic assumptions are listed in Table 6.

Table 6: Global Economic Assumptions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAXES</strong></td>
<td></td>
</tr>
<tr>
<td>Income Tax Rate</td>
<td>26% Effective (21% Federal, 6% State)</td>
</tr>
<tr>
<td>Capital Depreciation</td>
<td>20 years, 150% declining balance</td>
</tr>
<tr>
<td>Investment Tax Credit</td>
<td>0%</td>
</tr>
<tr>
<td>Tax Holiday</td>
<td>0 years</td>
</tr>
<tr>
<td><strong>CONTRACTING AND FINANCING TERMS</strong></td>
<td></td>
</tr>
<tr>
<td>Contracting Strategy</td>
<td>Engineering Procurement Construction Management (owner assumes project risks for performance, schedule, and cost)</td>
</tr>
<tr>
<td>Type of Debt Financing</td>
<td>Non-Recourse (collateral that secures debt is limited to the real assets of the project)</td>
</tr>
<tr>
<td>Repayment Term of Debt</td>
<td>10 years</td>
</tr>
<tr>
<td>Grace Period on Debt Repayment</td>
<td>0 years</td>
</tr>
<tr>
<td>Debt Reserve Fund</td>
<td>None</td>
</tr>
<tr>
<td><strong>ANALYSIS TIME PERIODS</strong></td>
<td></td>
</tr>
<tr>
<td>Capital Expenditure Period</td>
<td>1 – 3 years</td>
</tr>
<tr>
<td>Operational Period</td>
<td>20 years</td>
</tr>
<tr>
<td>Economic Analysis Period (used for IRROE)</td>
<td>21 or 23 Years (capital expenditure period plus operational period)</td>
</tr>
<tr>
<td><strong>TREATMENT OF CAPITAL COSTS</strong></td>
<td></td>
</tr>
<tr>
<td>Capital Cost Escalation During Capital Expenditure Period (nominal annual rate)</td>
<td>3.6%¹</td>
</tr>
<tr>
<td>Distribution of Total Overnight Capital over the Capital Expenditure Period (before escalation)</td>
<td>3-Year Period: 10%, 60%, 30%</td>
</tr>
<tr>
<td>Working Capital</td>
<td>zero for all parameters</td>
</tr>
<tr>
<td>% of Total Overnight Capital that is Depreciated</td>
<td>100% (this assumption introduces a very small error even if a substantial amount of TOC is actually non-depreciable)</td>
</tr>
<tr>
<td><strong>ESCALATION OF OPERATING REVENUES AND COSTS</strong></td>
<td></td>
</tr>
<tr>
<td>Escalation of Product Price (revenue), O&amp;M Costs, Fuel Costs (nominal annual rate)</td>
<td>3.0%²</td>
</tr>
<tr>
<td><strong>EXAMPLE FINANCING SCENARIO</strong></td>
<td></td>
</tr>
<tr>
<td>Debt/Equity Ratio</td>
<td>50%</td>
</tr>
<tr>
<td>Internal Rate of Return on Equity (IRROE)</td>
<td>20%</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>6%</td>
</tr>
</tbody>
</table>

¹ A nominal average annual rate of 3.6% is assumed for escalation of capital costs during construction. This rate is equivalent to the nominal average annual escalation rate for process plant construction costs between 1947 and 2008 according to the Chemical Engineering Plant Cost Index.

² An average annual inflation rate of 3.0% is assumed. This rate is equivalent to the average annual escalation rate between 1947 and 2008 for the U.S. Department of Labor's Producer Price Index for Finished Goods, the so-called "headline" index of the various Producer Price Indices. (The Producer Price Index for the Electric Power Generation Industry may be more applicable, but that data does not provide a long-term historical perspective since it only dates back to December 2003.)
APPENDIX C – 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 of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term “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 $1,000,000 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 even a couple of 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, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then 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 are generally the same for all types of entities. The specific rules applicable to:
- 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 regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten 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, equipment for their own company with organizational resources. If the item or service is reimbursed for, 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, 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. If questions exist, consult your DOE contact 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 only incur 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.
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 D – SAMPLE COST SHARE CALCULATION FOR BLENDED COST SHARE PERCENTAGE

The following example shows the math for calculating required cost share for a project with $2,000,000 in federal funds with four tasks requiring different non-federal cost share percentages:

<table>
<thead>
<tr>
<th>Task</th>
<th>Proposed Federal Share</th>
<th>Federal Share %</th>
<th>Recipient Share %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1 (R&amp;D)</td>
<td>$1,000,000</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Task 2 (R&amp;D)</td>
<td>$500,000</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Task 3 (Demonstration)</td>
<td>$400,000</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Task 4 (Outreach)</td>
<td>$100,000</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Tasks</th>
<th>$ Federal Share</th>
<th>% Federal Share</th>
<th>$ Non-Federal Share</th>
<th>% Non-Federal Share</th>
<th>Total Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>$1,000,000</td>
<td>80%</td>
<td>$250,000</td>
<td>20%</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>Task 2</td>
<td>$500,000</td>
<td>80%</td>
<td>$125,000</td>
<td>20%</td>
<td>$625,000</td>
</tr>
<tr>
<td>Task 3</td>
<td>$400,000</td>
<td>50%</td>
<td>$400,000</td>
<td>50%</td>
<td>$800,000</td>
</tr>
<tr>
<td>Task 4</td>
<td>$100,000</td>
<td>100%</td>
<td>$0</td>
<td>0%</td>
<td>$100,000</td>
</tr>
<tr>
<td>Totals</td>
<td>$2,000,000</td>
<td></td>
<td>$775,000</td>
<td></td>
<td>$2,775,000</td>
</tr>
</tbody>
</table>

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)
APPENDIX E – WAIVER REQUESTS FOR:
1. SUBRECIPIENT FOREIGN ENTITY PARTICIPATION; AND
2. FOREIGN WORK

1. Subrecipient Waiver for Foreign Entity Participation
For projects selected under this FOA, all 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 for each proposed foreign subrecipient.

WAIVER CRITERIA
Foreign entities seeking to participate as a subrecipient 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 U.S. industry and U.S. 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 U.S. 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 U.S. and the entity acknowledges and demonstrates that it has the intent and ability to comply with the U.S. Manufacturing Plan; and

e. The foreign entity will satisfy other conditions that may be deemed necessary by DOE to protect U.S. 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 with the Institute;
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 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 U.S. economy;
   ▪ How the project will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
   ▪ How the project will promote domestic American manufacturing of products and/or services;

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 U.S., 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, 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.

The Applicant does not have the right to appeal DOE’s decision concerning a waiver request.

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

As set forth in Section IV.H.iii., all work under funding 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 U.S. (“foreign work”);
2. A description of the work proposed to be performed outside the U.S.;
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 US 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 U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
7. How the foreign work will promote domestic American manufacturing of products and/or services;
8. A description of the likelihood of Intellectual Property (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.

The Applicant does not have the right to appeal DOE’s decision concerning a waiver request.
APPENDIX F – 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 requirements, the following definitions apply:

Construction materials includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives— that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- lumber; or
- drywall.

Infrastructure includes, at a minimum, the structures, facilities, and equipment for, in the United States, Roads, highways, and bridges; public transportation; Dams, ports, harbors, and other maritime facilities; Intercity passenger and freight railroads; Freight and intermodal facilities; airports; Water systems, including drinking water and wastewater systems; Electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

In addition to the above, the infrastructure in question must be publicly-owned or must serve a public function; privately owned infrastructure that is solely utilized for private use is not considered “infrastructure” for purposes of Buy America applicability. The Agency, not the Applicant, will have the final say as to whether a given project includes infrastructure, as defined herein. Accordingly, in cases where the “public” nature of the infrastructure is unclear, DOE strongly recommends that Applicants complete their full application with the assumption that Buy America requirements will apply to the proposed project.

Project means the construction, alteration, maintenance, or repair of infrastructure in the United States.

B. Buy America Requirements for Infrastructure Projects (“Buy America” requirements)
In accordance with section 70914 of the BIL, none of the project funds (includes federal share and recipient cost share) may be used for a project for infrastructure unless:

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45 BIL, § 70917(c)(1).
(1) all iron and steel used in the project are 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; and

(3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America requirements only apply to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure 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 a Buy America requirements 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.

These requirements must flow down to all sub-awards, all contracts, subcontracts and purchase orders for work performed under the proposed project.

For additional information related to the application and implementation of these Buy America requirements, please see OMB Memorandum M-22-11, issued April 18, 2022:

46 Excludes cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.
C. DOE Submission Requirements for Full Application

Phase II will involve the construction, alteration, and/or repair of infrastructure in the United States.

D. Waivers

In limited circumstances, DOE may waive the application of the Buy America requirements where DOE determines that:

(1) applying the Buy America requirements would be inconsistent with the 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; 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.

If an Applicant is seeking a waiver of the Buy America requirements, it must include a written waiver request with the Full Application. A waiver request must include:

- A detailed justification for the use of “non-domestic” iron, steel, manufactured products, or construction materials to include an explanation as to how the non-domestic item(s) is essential to the project
- A certification that the Applicant or recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and nonproprietary communications with potential suppliers;
- Applicant /Recipient name and Unique Entity Identifier (UEI)
- Total estimated project cost, DOE and cost-share amounts
- Project description and location (to the extent known)
- List and description of iron or steel item(s), manufactured goods, and construction material(s) the Applicant or recipient seeks to waive from Domestic Content Procurement Preference requirement, including name, cost, country(ies) of origin (if known), and relevant PSC and NAICS code for each.
- Waiver justification including due diligence performed (e.g., market research, industry outreach) by the Applicant or recipient
- Anticipated impact if no waiver is issued

DOE may require additional information before considering the waiver request.

Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office. There may be instances where an award qualifies, in
whole or in part, for an existing waiver. The DOE may make available information on currently applicable general applicability waivers when available.

The Applicant does not have the right to appeal DOE’s decision concerning a waiver request.
APPENDIX G – STATEMENT OF PROJECT OBJECTIVES

STATEMENT OF PROJECT OBJECTIVES
Title of Project
(Insert the title of the work to be performed. Be concise and descriptive)

This should be a standalone document that states the work to be conducted and should not include any proprietary/confidential information.

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Note: if the project will be performed in phases, include specific objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work. Note: if the project will be performed in phases, includes specific scope statement(s) for each phase.

C. TASKS TO BE PERFORMED

This section provides a brief summary of the planned approach to this project. Tasks/subtasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. In writing the Statement of Project Objectives (SOPO), avoid 1) the use of proper nouns to minimize SOPO modifications in the event of changes to the project team, facilities, etc.; 2) figures and equations; 3) references to other documents and publications; and 4) details about past work and discussion of technical background (which should be covered elsewhere in the application narrative).

Task 1.0 - Project Management and Planning (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES. REFERENCE APPENDIX FOR FORMAT).

“The Recipient shall manage and direct the project in accordance with a Project Management Plan to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities in order to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented and project reporting and briefing requirements are satisfied.

The Recipient shall update the Project Management Plan 30 days after award and as necessary throughout the project to accurately reflect the current status of the project.
Examples of when it may be appropriate to update the Project Management Plan include: (a) project management policy and procedural changes; (b) changes to the technical, cost, and/or schedule baseline for the project; (c) significant changes in scope, methods, or approaches; or (d) as otherwise required to ensure that the plan is the appropriate governing document for the work required to accomplish the project objectives.

Management of project risks will occur in accordance with the risk management methodology delineated in the Project Management Plan in order to identify, assess, monitor and mitigate technical uncertainties as well as schedule, budgetary and environmental risks associated with all aspects of the project. The results and status of the risk management process will be presented during project reviews and in quarterly progress reports with emphasis placed on the medium- and high-risk items.”

Subtask 1.2 – Technology Maturation Plan (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES. REFERENCE APPENDIX FOR FORMAT.)

“The Recipient shall develop a Technology Maturation Plan (TMP) that describes the current technology readiness level (TRL) of the proposed technology/technologies, relates the proposed project work to maturation of the proposed technology, describes the expected TRL at the end of the project, and describes any known post-project research and development necessary to further mature the technology. The initial TMP is due 90 days after award and should be updated as needed throughout the project period of performance. A final TMP should be submitted at the completion of the project.”

Applicant should include a concise description of the work to be conducted for each Task (2.0-5.0). If the task includes subtasks, provide a general description of how each subtask is related to the overall scope of the task.

Task 2.0 - Community Benefits Plan

Task 3.0 - National Environmental Policy Act (NEPA)

Task 4.0 - Permits for Construction and Operation

Task 5.0 – AACE Class 3 FEED Study

APPLICANT continue with tasks/sub-tasks as necessary.

Task 6.0 - (Title)
Task descriptions should include a concise description of the work to be conducted for each task. If the task includes subtasks, provide a general description of how each subtask is related to the overall scope of the task.

Subtask 6.1 - (Title)
Subtask descriptions should include a concise description of the work to be conducted for each subtask.

Subtask 6.2 - (Title)

APPLICANT: If materials characterization is performed (i.e., elemental concentrations; proximate/ultimate analyses; ash content; phase identification/concentrations; morphology information) by an award Recipient in order to develop their extraction, separation, recovery and conversion to metals process, ensure you propose a task/subtask. In addition, these analyses will be required to be included in the Recipient’s Phase I Final Technical Report, and provided to NETL in an EDX template provided by NETL that will be uploaded to NETL’s publicly available database (see Section D below).

D. DELIVERABLES (Required: Applicant insert the Language provided below in quotes and continue to complete.)

“The periodic and final reports shall be submitted in accordance with the “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist. In addition to the reports specified in the “Federal Assistance Reporting Checklist”, the Recipient must provide the following to the NETL Project Manager (identified in Block 15 of the Assistance Agreement as the Program Manager).”

<table>
<thead>
<tr>
<th>Task / Subtask Number</th>
<th>Deliverable Title</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Project Management Plan</td>
<td>Update due 30 days after award. Revisions to the PMP shall be submitted as requested by the NETL Project Manager.</td>
</tr>
<tr>
<td>1.2</td>
<td>Technology Maturation Plan (TMP)</td>
<td>Update due 90 days after award. Updates to the TMP shall be submitted, as needed, throughout the project period of performance. A final TMP is due as an attachment to the Final Report.</td>
</tr>
<tr>
<td>2.0</td>
<td>Community Benefits Plan</td>
<td>Updated J40 and Engagement Plan Development Proposals due at 90 days</td>
</tr>
</tbody>
</table>

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after award. Updated DEIA and Quality Jobs Plans due 90 days after award. Full J40 and Engagement Plans due 90 after updated Plan Development Proposals are submitted. Updates on Community Benefits Plan progress and outcomes shall be submitted, as needed, throughout the project period of performance. A final Community Benefits Plan package is due as an attachment to the Final Report.

<table>
<thead>
<tr>
<th>3.X</th>
<th>Environmental Volume (EV)</th>
<th>The revised EV is due 30 days after award.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.X</td>
<td>Copy of completed NEPA Environmental Assessment (EA) or Environmental Impact Statement (EIS) documentation achieving either a Finding Of No Significant Impact (FONSI) or Record Of Decision (ROD).</td>
<td>Due with down-select application to Phase II.</td>
</tr>
<tr>
<td>4.X</td>
<td>Copy of permits for site construction and operation of the REE Demonstration Facility or description of substantial progress towards obtaining required permits</td>
<td>Due with down-select application to Phase II.</td>
</tr>
<tr>
<td>5.X</td>
<td>AACE Class 3 FEED Study</td>
<td>Due with down-select application to Phase II.</td>
</tr>
<tr>
<td>5.X</td>
<td>Executed Host Site Agreement(s)</td>
<td>Due with down-select application to Phase II.</td>
</tr>
<tr>
<td>5.X</td>
<td>Executed Feedstock Agreement(s)</td>
<td>Due with down-select application to Phase II.</td>
</tr>
<tr>
<td>5.X</td>
<td>Produced Materials Disposition Plan</td>
<td>Due with down-select application to Phase II.</td>
</tr>
</tbody>
</table>
### 5.X Executed Off-Take Agreement(s)

Due with down select application to Phase II.

- **Required if Proposed in Phase I:** Chemical characterization or analytical data, if generated, in Phase I Analyses will be required to be included in the Recipient’s Phase I Final Technical Report and be uploaded to NETL’s publicly available Energy Data eXchange (EDX) database platform in the format provided by NETL.

EDX can be found by accessing the following URL link: [https://edx.netl.doe.gov/ree-cm/](https://edx.netl.doe.gov/ree-cm/)

**APPLICANT** continue to identify deliverables (other than those identified on the “Federal Assistance Reporting Checklist”) that will be delivered using the format provided in the table above. Ensure the delivery date to NETL is also identified. For examples: Delivery to NETL X months after completion of Task/Subtask X.

**NOTE:** If the application is selected for award, DOE may require the Recipient to include additional deliverables, provided that such deliverables are consistent with the budget, schedule, and scope of the project.

#### E. BRIEFINGS/TECHNICAL PRESENTATIONS

(Required: Applicant insert the language provided below in quotes and continue to complete.)

“The Recipient shall prepare detailed briefings for presentation to the NETL Project Manager at their facility located in Pittsburgh, PA, Morgantown, WV, Albany, OR, or via WebEx. The Recipient shall make a presentation to the NETL Project Manager at a project kick-off meeting held within ninety (90) days of the project start date. At a minimum, annual briefings shall also be given by the Recipient to explain the plans, progress, and results of the technical effort and a final project briefing at the close of the project shall also be given.

Informal monthly briefings to the Federal Project Manager, Technology Manager, and Headquarters Program Manager will be given by the Recipient to explain the plans, progress, and results of the technical effort. At the discretion of the Awardee and/or DOE, other briefings/presentations may be added to the Statement of Project Objectives (SOPO), provided that such briefings/presentations are consistent with the budget, schedule, and scope of the project.
The Recipient will conduct a public presentation and peer review on Community Benefits Plan work in a Mid-Project Update halfway through the performance period. The Recipient will conduct a public Community Benefits Plan End of Project Progress Report on CBP work at end of award.”

At the Applicant’s discretion, other briefings/presentations may be added to Section E of the SOPO.

NOTE: If the application is selected for award, DOE may require the Recipient to include additional briefings/presentations, provided that such briefings/presentations are consistent with the budget, schedule, and scope of the project.
APPENDIX H – DATA MANAGEMENT PLAN

A Data Management Plan (“DMP”) explains how data generated in the course of the research or work performed under an assistance award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

DMP Requirements

In order for a DMP to be considered acceptable, the DMP must address the following:

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are 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 publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

The DMP should consult and reference available information about data management resources to be used in the course of the proposed work. In particular, a DMP that explicitly or implicitly commits data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at DOE User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other DOE facilities can be found in the additional guidance from the sponsoring program.

The DMP must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all laws (i.e., export control laws), and DOE regulations, orders, and policies.

Data Determination for a DMP

The Project Director should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.
For data that will be generated through the course of the proposed work, the Project Director should indicate what types of data should be protected from immediate public disclosure by DOE (referred to as “protected data”) and what types of data that DOE should be able to release immediately. Similarly, for data developed outside of the proposed work at private expense that will be used in the course of the proposed work, the Project Director should indicate whether that type of data will be subject to public release or kept confidential (referred to as “limited rights data”). Any use of limited rights data or labeling of data as “protected data” must be consistent with the DMP Requirements noted above.

Suggested Elements for a DMP

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

**Data Types and Sources**: A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.

**Content and Format**: A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

**Sharing and Preservation**: A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation. A description of how the recipient intends to make the results of any resulting DOE-funded work available to the public, including the relevant technical community.

**Protection**: A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and
intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

**Rationale:** A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

**Additional Guidance**

In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

DMPs should reflect relevant standards and community best practices and make use of community accepted repositories whenever practicable.

Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

To improve the discoverability of and attribution for datasets created and used in the course of research, DOE encourages the citation of publicly available datasets within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, DOE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service.

**Definitions**

**Data Preservation:** Data preservation means providing for the usability of data beyond the lifetime of the research activity that generated them.

**Data Sharing:** Data sharing means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to anyone through, for example, a web-based platform.

**Digital Research Data:** The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data.
**Research Data**: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This ‘recorded’ material excludes physical objects (e.g., laboratory samples). Research data also do not include:

(A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.”

**Validate**: In the context of DMPs, validate means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.
The Applicant’s Project Management Plan (PMP) is an approved document that defines how the Applicant will execute, monitor, and control the project to accomplish the objectives. The specific contents, level of detail, and inclusion of subsidiary planning documents are tailored according to the needs of the project. Consequently, every PMP will be different based on the risk, visibility, and/or complexity of the project and the Recipient’s established processes, procedures, and systems.

Title Page:

PROJECT MANAGEMENT PLAN

{Insert Project Title}

{Date Prepared}

SUBMITTED BY

{Organization Name}

{Organization Address}

{City, State, Zip Code}

Project Director

{Name}

{Phone Number}

{E-mail}

SUBMITTED TO

U.S. Department of Energy
National Energy Technology Laboratory

This plan should be formatted to include the following sections with each section to include the information as described below:

A. **Executive Summary:** Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative and should be simply copied to this document for completeness, so
that the Project Management Plan is a stand-alone document.

B. **Project Organization and Structure:** Provide the following information in this section:

- **Organizational Chart(s):** Include a complete project organizational chart and sub-organization charts (if applicable), accompanied by a discussion of how the organizational structure will facilitate the performance of the Tasks and achievement of the objectives described in the SOPO within the time frame specified in the application.

- **Roles and Responsibilities of Participants:** Provide a discussion of key project team members, and the capacity in which each team member will assist in achieving the overall objective(s) of the proposed project. For multi-organizational or multi-investigator projects, describe the roles to be performed by each participant/investigator within the context of the Task/subtask structure contained in the SOPO. Include descriptions of any business agreements or intellectual property issues between the Applicant and other members of the project team, and how these agreements will be integrated and managed.

- **Decision-making and Communication Strategy:** Provide a discussion of how communication and decision-making will occur within the context of the organizational structure, with particular emphasis on scientific/technical direction and mechanisms for controlling project scope, cost, and schedule. Include a discussion of how the project team will communicate with DOE and external stakeholders during the performance of the project.

- **Management Capabilities:** Provide information relevant to the capabilities and experience of the PI and key project team members in managing technical projects of similar nature and complexity. If applicable, include examples that demonstrate the ability to successfully meet research objectives within scope, budget and schedule.

C. **Risk Management Plan:** Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. Risk is inherent to all projects regardless of complexity, cost, or visibility. An effective Risk Management Plan will identify perceived risks and explain mitigation strategies for each risk. At a minimum, the Risk Management Plan shall include the initial identification of significant financial, cost/schedule, technical/scope, management, planning and oversight, ES&H, external factors, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.

The following table format is provided but is not required:

<table>
<thead>
<tr>
<th>Perceived Risk</th>
<th>Risk Rating</th>
<th>Mitigation/Response Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Impact</td>
</tr>
</tbody>
</table>
Financial Risks:

Cost/Schedule Risks:

Technical/Scope Risks:

Management, Planning, and Oversight Risks:

ES&H Risks:

External Factor Risks:

D. **Milestone Log:** Provide milestones for each budget period of the project. Each milestone should be linked to a specific Task or Subtask and include a title, planned completion date, and a description of the method/process/measure used to verify completion. Milestones should be quantitative and show progress toward budget period and/or project goals. Conversely, periodic, mandatory progress reports are not considered to be Milestones.

Milestones are presumed to lie on the critical path of the project, i.e., unless all milestones are achieved, the Objectives as defined in the SOPO cannot be met completely. Applicants must provide at least two milestones per year throughout the course of the project.

**Milestone Format**

<table>
<thead>
<tr>
<th>Task/Subtask</th>
<th>Milestone Title &amp; Description</th>
<th>Planned Completion Date</th>
<th>Verification method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly progress report as prescribed under the Federal Assistance Reporting Checklist. The Milestone Status will present actual performance in comparison with Planned Milestones, and include:

1. the actual status and progress of the project,
(2) specific progress made toward achieving the project's milestones, and,
(3) any proposed changes in the project's schedule required to complete milestones.]

E. **Costing Profile:** Provide a table (the Spend Plan) that projects the expenditures of government funds by fiscal year for each project team member.

**Spend Plan by Fiscal Year Format**

<table>
<thead>
<tr>
<th></th>
<th>FY 20XX</th>
<th></th>
<th>FY 20XX</th>
<th></th>
<th>FY 20XX</th>
<th></th>
<th>FY 20XX</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DOE Funds</td>
<td>Cost Share</td>
<td>DOE Funds</td>
<td>Cost Share</td>
<td>DOE Funds</td>
<td>Cost Share</td>
<td>DOE Funds</td>
<td>Cost Share</td>
<td>DOE Funds</td>
</tr>
<tr>
<td>Applicant</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sub-recipient A, if proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sub-recipient B, if proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>FFRDC/NL, if proposed</td>
<td></td>
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<td></td>
<td></td>
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<td>Total ($)</td>
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<td></td>
<td></td>
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<tr>
<td>Total Cost Share %</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F. **Project Timeline:** Provide a timeline of the project (similar to a Gantt chart) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date, and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (Section C).

**Project Timeline (Gantt Chart) Example**

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Task Details</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtask 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milestone A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtask 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milestone B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Point 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtask 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milestone C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Point 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtask 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milestone D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Point 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

G. **Success Criteria:** Success criteria are used by the DOE to determine if specific goals and objectives were met at the end of budget period(s), Go/No-Go decision points, and/or project completion. The success criteria should be objective and stated in terms of specific,
measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

[Note: As the first task in the Statement of Project Objectives, successful Applicants will revise the version of the Project Management Plan that is submitted with their applications by including details from the negotiation process. This Project Management Plan will be updated by the Recipient as the project progresses, and the Recipient must use this plan to report scope, schedule, and budget variances.]
**APPENDIX J — FUNDING PLAN**

The Applicant must present a viable plan to obtain funding for the entire non-DOE share of the total project cost in the form of a Funding Plan that identifies all sources of project funds. The Funding Plan shall be comprised of a Phase I Project Financing Plan and a Phase II Project Financing Plan.

**Phase I Project Financing Plan**
Applicants must provide a plan for financing the Phase I effort. The Phase I Project Financing Plan shall address the Applicant’s financial commitment to the project by including a commitment letter from any party (other than the organization submitting the application) proposing to provide all or part of the required Phase I non-federal cost share. A commitment letter should state the amount and timing of the funds to be made available for the project; and should provide information on the source(s) of the funds along with the authority of the signor of the letter to commit such funds to the project. Any existing approvals, such as minutes from a board of directors meeting, should be included in the application materials. Limitations, restrictions, contingencies, or the like on the commitment must be disclosed in the letter. The letter should be signed by the person authorized to commit the expenditure of funds by the entity.

For non-federal cost share commitments that are in the form of cash, each provider must present audited financial statements for the prior year and all unaudited interim financial statements for the current year. If audited financial statements are not available, the financial statements presented must be certified by the Chief Financial Officer (CFO) of the organization that the statements were prepared on the basis of U.S. Generally Accepted Accounting Principles (US GAAP). Each provider must describe how the financial statements evidence the capacity of the provider to supply their committed cost share.

For non-federal cost share commitments that are not in cash, provide a full description of the commitment and justification for the qualification of such commitment as non-federal cost share. Provide supporting evidence regarding the value of the non-cash commitment.

**Phase II Project Financing Plan**
Describe the strategies and tactics to be deployed to secure funding for the construction phase of the project in a Phase II Project Financing Plan. The Phase II Project Financing Plan shall be based on a business plan for the development, construction, and operation of the project. The Plan must be based on assumptions that are consistent with other materials in the application.
and should demonstrate that the project has adequate funding by addressing all the financing aspects of the Phase II.

Project Parties. A description of the main parties (developers, owners, investors) to the project, including background, ownership and experience, proposed financial contribution to project, and expected financial benefit to each party of the project.

Project Assumptions. A description and explanation for each of the financial, economic, and operating assumptions for the project. The assumptions should be consistent with and supported by other documents in the application materials.

Contracts and Agreements. A description of all contracts, agreements, permits, licenses, etc., that will need to be established or obtained to finance the project. Also describe agreements to be entered into regarding the operation of the project and any related responsibilities of the Project Parties.

Financial Projections. Financial projections should be presented on an annual basis, commence with the initial project Phase, and extend to the end of the life of the facility. Projections should include a statement of revenues and expenses (income statement), balance sheet, and cash flow statement (sources and uses of funds). In addition, a cashflow waterfall schedule should be included as well as projections of annual net cash flows (for purposes of calculating NPV and IRR). The projections should be adequately supported. The statements and schedules should be prepared using Excel™ 2003 (or more recent) software and the Excel-based model should be provided in electronic format including cell formulas so that review of the model assumptions and calculations may be facilitated. The financial model must submit a fully functional interactive Microsoft Excel spreadsheet file depicting a preliminary financial model of the proposed process. The model/file must have no locked or hidden cells and should clearly state all assumptions. Save this information in a file named "Model.xls or xlxs," and click on "Add Optional Other Attachment" to attach.

Financial Commitments. The Applicant must discuss the priority placed by their teams’ respective management on financing the project. This should include a discussion of management’s decision to: (1) allocate internal resources, (2) obtain recourse financing, or (3) obtain limited or non-recourse project financing. The degree of commitment to the project will be measured in part by the level of financial commitment assumed by project team members. The project team can also demonstrate its commitment by: (A) sharing in project costs above
the Government’s minimum requirements and (B) agreeing to cover potential project cost increases.

Limited Recourse Project Financing. For projects employing non-recourse or limited recourse debt financing, provide a description of the Applicant’s approach to, and the status of, such financing. Include copies of available funding commitments, draft Term Sheets, or expressions of interest from funding sources.

Equity: If tax credit equity is part of the financing plan, provide a description of the structure of the legal arrangements either in place or contemplated. Project when tax equity contributions to pay project costs will be made. List prospects for other equity investors and include progress to date in gaining interest in the project by such investors.

Applicants must provide a plan for financing the Phase II effort. The Phase II Project Financing Plan shall address the Applicant’s financial commitment to the project by including a commitment letter from any party (other than the organization submitting the application) proposing to provide all or part of the required Phase II non-federal cost share. A commitment letter should state the amount and timing of the funds to be made available for the project; and should provide information on the source(s) of the funds along with the authority of the signator of the letter to commit such funds to the project. Any existing approvals, such as minutes from a board of directors meeting, should be included in the application materials. Limitations, restrictions, contingencies, or the like on the commitment must be disclosed in the letter. The letter should be signed by the person authorized to commit the expenditure of funds by the entity.

For non-federal cost share commitments that are in the form of cash, each provider must present audited financial statements for the prior year and all unaudited interim financial statements for the current year. If audited financial statements are not available, the financial statements presented must be certified by the Chief Financial Officer (CFO) of the organization that the statements were prepared on the basis of U.S. Generally Accepted Accounting Principles (US GAAP). Each provider must describe how the financial statements evidence the capacity of the provider to supply their committed cost share.

For non-federal cost share commitments that are not in cash, provide a full description of the commitment and justification for the qualification of such commitment as non-federal cost share. Provide supporting evidence regarding the value of the non-cash commitment.
Commitment letters must identify the type of proposed cost sharing (e.g., cash, services, and/or property) to be contributed. If property or services are proposed, the Applicant should provide support for their valuation and explain how valuation was determined. If a property appraisal is used, the Applicant should provide a copy and an explanation of whether the property values used are acquisition, book, or replacement costs.

Contract Bonding Practices. For proposed construction contracts or subcontracts, the Applicant must explain its contract bonding and/or surety/guarantor practices and how they will be applied if their application is accepted for Federal funding.

Financing Schedule. A tentative schedule of dates and events that comprise the financing efforts must be provided. The schedule shall include, to the extent possible, key project dates such as signing of the EPC contract, negotiating Purchase and Sale agreements, finalizing the Operations and Maintenance Agreement, and the target date for financial closing for construction.

Detailed requirements for an updated Phase II Project Financing Plan will be included in the down-selection application specifications to be issued at a later date.

The application should include a Funding Plan that is comprised of a Phase I Project Financing Plan and the Phase II Financing Plan which are further comprised of the following:

- The Applicant’s financial commitment to the project is evidenced by a commitment letter for the Phase I non-federal cost share. A commitment letter should state the amount and timing of the funds to be made available for the project; and should provide information on the source(s) of the funds along with the authority of the signor of the letter to commit such funds to the project. Any existing approval, such as minutes from a board of directors meeting, should be included in the application materials. Limitations, restrictions, contingencies, or the like on the commitment must be disclosed in the letter.

- If other parties are to provide non-federal cost share for Phase I, such parties must also provide commitment letters including the same information as above. In addition, other parties must disclose their relationship to the Applicant, or other interests in the project.

- For non-federal cost share commitments that are in the form of cash, each provider must present audited financial statements for the prior year and all unaudited interim financial statements for the current year. If audited financial statements are not available, the financial statements presented must be certified by the Chief Financial
Officer (CFO) of the organization that the statements were prepared on the basis of U.S. Generally Accepted Accounting Principles (US GAAP). Each provider must describe how the financial statements evidence the capacity of the provider to supply their committed cost share.

- For non-federal cost share commitments that are not in cash, provide a full description of the commitment and justification for the qualification of such commitment as non-federal cost share. Provide supporting evidence regarding the value of the non-cash commitment.

- The strategies and tactics to be deployed to secure funding for the construction phase of the project should be presented in a **Phase II Project Financing Plan**.

- The **Phase II Project Financing Plan** shall be based on a business plan for the development, construction, and operation of the project and based on assumptions that are consistent with other materials in the application and should demonstrate that the project has adequate funding by addressing all the financing aspects of the Phase II.

- The **Phase II Project Financing Plan** elements include:
  - Project Parties. A description of the main parties (developers, owners, investors) to the project, including background, ownership and experience, proposed financial contribution to project, and expected financial benefit to each party of the project.
  - Project Assumptions. A description and explanation for each of the financial, economic, and operating assumptions for the project. The assumptions should be consistent with and supported by other documents in the application materials.
  - Contracts and Agreements. A description of all contracts, agreements, permits, licenses, etc., that will need to be established or obtained to finance the project. Also describe agreements to be entered into regarding the operation of the project and any related responsibilities of the Project Parties.
  - Financial Projections. Financial projections should be presented on an annual basis, commence with the initial project Phase, and extend to the end of the life of the facility. Projections should include a statement of revenues and expenses (income statement), balance sheet, and cash flow statement (sources and uses of funds). In addition, a cashflow waterfall schedule should be included as well as projections of annual net cash flows (for purposes of calculating NPV and IRR). The projections should be adequately supported. The statements and schedules should be prepared using Excel® 2003 (or more recent) software and the Excel®-based model should be provided in electronic format including cell formulas so that review of the model assumptions and calculations may be facilitated.
Financial Commitments. The Applicant must discuss the priority placed by their teams’ respective management on financing the project. This should include a discussion of management’s decision to: (1) allocate internal resources, (2) obtain recourse financing, or (3) obtain limited or non-recourse project financing. The degree of commitment to the project will be measured in part by the level of financial commitment assumed by project team members. The project team can also demonstrate its commitment by: (A) sharing in project costs above the Government’s minimum requirements and (B) agreeing to cover potential project cost increases.

Limited Recourse Project Financing. For projects employing non-recourse or limited recourse debt financing, provide a description of the Applicant’s approach to, and the status of, such financing. Include copies of available funding commitments, draft Term Sheets, or expressions of interest from funding sources.

Equity: If tax credit equity is part of the financing plan, provide a description of the structure of the legal arrangements either in place or contemplated. Project when tax equity contributions to pay project costs will be made. List prospects for other equity investors and include progress to date in gaining interest in the project by such investors.

- The Applicant should include commitment letters to provide funds in accordance with the terms of this funding opportunity announcement. Commitment letters must be issued by each organization that is slated to provide funding. The funds must be committed in accordance with the terms of this funding opportunity announcement and consistent with the application. The commitments should state the amount of funds to be provided, the fact that the funds are non-federal cost share, the relationship of the funding source to the Applicant, the timing of funding, and any caveats, restrictions, limitations or the like. Commitments to provide funds shall be submitted in a letter signed by an officer of the corporation or other entity that is qualified to commit the funding to the proposed project.

- Commitment letters must identify the type of proposed cost sharing (e.g., cash, services, and/or property) to be contributed. If property or services are proposed, the Applicant should provide support for their valuation and explain how valuation was determined. If a property appraisal is used, the Applicant should provide a copy and an explanation of whether the property values used are acquisition, book, or replacement costs.
o Contract Bonding Practices. For proposed construction contracts or subcontracts, the Applicant must explain its contract bonding and/or surety/guarantor practices and how they will be applied if their application is accepted for Federal funding.

o Financing Schedule. A tentative schedule of dates and events that comprise the financing efforts must be provided. The schedule shall include, to the extent possible, key project dates such as signing of the EPC contract, negotiating Purchase and Sale agreements, finalizing the Operations and Maintenance Agreement, and the target date for financial closing for construction.
A technology maturation plan (TMP) is a planning tool that summarizes the necessary research and development (R&D) steps to advance the maturation of a specified technology to a targeted technology readiness level (TRL) and defines the key performance metrics that will be used to determine if the targeted TRL has been successfully achieved. A TMP also documents the current TRL of the specified technology, defines the ultimate commercial application of the technology, and conceptualizes a future commercialization pathway in terms of additional R&D, resources, and schedule. A TMP is a high-level summary document. It is not a collection of detailed test plans.

The National Energy Technology Laboratory (NETL) uses TMPs to enhance its stewardship of R&D project portfolios and improve the value of the technologies it develops. TMPs help NETL to:

- ensure that research questions are resolved in the least expensive and least risky R&D setting (i.e., scale, degree of integration, environment, fidelity)
- focus technology development on the performance metrics that are most important for technical and economic success (at component and system levels)
- identify R&D gaps and critical components that are lagging in maturity
- ensure that R&D projects address what is required for integration into higher-level systems
- make informed decisions at critical stages of research (e.g., moving a technology from a laboratory project to a larger-scale pilot project)
- improve the balance of project portfolios in terms of technology types, pathways, TRLs, redundancy, etc., to mitigate risks and increase the likelihood of R&D success, and
- forecast the cost and duration of technology development through demonstration and commercialization.

The template provided below should be used to complete a TMP. Instructions, shown in italics, should be deleted/replaced in the completed TMP. Section 3 is provided solely for reference but should be retained as-is in the completed TMP.
TECHNOLOGY MATURATION PLAN
for {insert project title}
{Date Prepared}

SUBMITTED UNDER FUNDING OPPORTUNITY ANNOUNCEMENT

DE-FOA-#######

SUBMITTED BY

{Organization Name}
{Organization Address}
{City, State, Zip Code}

Project Director

{Name}
{Phone Number}
{E-mail}

SUBMITTED TO

U.S. Department of Energy
National Energy Technology Laboratory
1.0 INTRODUCTION

1.1 Purpose of the Project

Provide a brief summary of the project’s objectives as related to maturation of the proposed technology.

1.2 Technology Readiness Assessment System

Technology maturation is quantified by performing a technology readiness assessment (TRA) on the specified technology system.

- Identify the specified “TRA System” and describe all the critical components and/or subsystems that comprise it. See “TRA System” definition under Section 3.1.
- State whether the current project will test: (1) the total, integrated TRA System, or (2) one or more critical subsystems or components of the TRA System. If the latter, identify which critical subsystems and/or components will be tested.

1.3 Commercial Application

Provide a one-paragraph description of the targeted commercial application(s) of the TRA System.

2.0 MATURATION OF THE TRA SYSTEM

2.1 Beginning Technology Readiness Level (TRL) of the TRA System

Briefly summarize the prior research that matured the technology to its current state.

Using the Technology Readiness Levels (TRL) descriptions in Sections 3.2 and 3.3, specify the current (i.e., pre-project) TRL of the TRA System. To attain a certain TRL, all aspects of the associated TRL description must be met.

Justify the specified TRL by explaining how all the required TRL aspects have been achieved.

2.2 Proposed Research to Mature the TRA System

Identify the TRL that the project plans to attain.

- Note that the targeted TRL could be the same as the beginning TRL if the project is aimed at making only incremental progress toward achieving the next TRL.
- If the project proposes to advance the TRL by more than one level, explain if that will be accomplished in stages (i.e., first one TRL, then the next) or by skipping a TRL. If the latter, explain how any increased technical, cost and schedule risks associated with skipping a TRL will be mitigated.
Identify each of the key performance attributes that will be assessed during the research along with the corresponding, quantifiable performance requirements that must be achieved to attain the targeted TRL(s). Explain how the key performance attributes were selected and how the corresponding requirements were determined. Be as specific as practical on any supporting technical/economic assessments (see Section 3.4 for NETL’s Systems Analysis Best Practices). As a general principle, all key performance requirements that may be appropriately tested at a particular TRL must be substantially met, thereby supporting the feasibility of commercial success/goal achievement, prior to proceeding to the subsequent TRL.

Briefly summarize the proposed research steps and how they will mature the TRA System to the targeted TRL(s).

2.3 Potential Post-Project Maturation and Commercialization of the TRA System

Assuming the project successfully attains the targeted TRL(s), describe what additional (post-project) work would be required to mature the TRA System to the next TRL. Identify the key performance requirements and goals/measures that would need to be achieved. If possible, provide rough estimates of the cost and duration of the research required to attain the next TRL.

Describe your organization’s potential role in a commercialization strategy for the TRA system.

3.0 REFERENCE MATERIAL

3.1 Definition of TRA System

NETL’s interpretation (Section 3.2) of the DOE TRL definitions (Section 3.3) is based on a view of technology maturation in which “components” are integrated into a “system” that is being assessed for its technology readiness. To clearly and consistently apply the DOE TRL definitions, one must first precisely identify what “system” is being assessed, defined herein as the “Technology Readiness Assessment (TRA) System.” Since most technologies can be viewed as subsystems within larger systems, multiple choices are available for defining the TRA System. However, note that the choice of the “level” of the TRA System affects how TRLs are assessed:

- A TRL 3 is achieved for the specified TRA System when analytical performance predictions for each of the TRA System’s critical components have been validated in separate experiments (i.e., without integration across components). Accordingly, the table in Section 3.2 shows the required scope of TRL 3 as “single component” and the

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47 A component or subsystem of a TRA System is considered critical if it is new, novel, and necessary for the TRA System to meet its anticipated operational performance requirements or poses major cost, schedule, or performance risk during design or demonstration. Note that a component that is fully mature and non-critical for an established application or operational environment may be considered critical if it is incorporated into a new application or operational environment.
required integration of TRL 3 as “none.”

- A TRL 4 or 5 is achieved for a given TRA System when the targeted performance requirements for each of its critical, multi-component subsystems (or the entire TRA system) have been validated in a laboratory environment (TRL 4) or relevant environment (TRL 5) with integration of some or all components.
- Achieving TRLs 6 to 9 requires testing of the entire, fully integrated, TRL system.

To further clarify, consider, for example, a fuel cell stack. Its critical components are multiple, identical fuel cells. In turn, the critical components of each fuel cell are an anode, cathode, and electrolyte. If one wished to assess the technology readiness of the fuel cell stack, the TRA System would be defined as an integrated system of multiple fuel cell subsystems, and a TRL 6 could only be achieved by successfully testing an entire stack of integrated fuel cells. However, if one instead wished to assess the technology readiness of only the fuel cell, the TRA System would be defined as an integrated system of cathode, anode, and electrolyte components, and a TRL 6 could be achieved by successfully testing just a single, integrated fuel cell. In both cases, achievement of TRL 6 could be claimed, but only in the context of the properly specified TRA System.
### 3.2 NETL Interpretations of DOE Technology Readiness Levels in the Context of Fossil Energy and Carbon Management R&D

<table>
<thead>
<tr>
<th>TRL</th>
<th>DOE Definition</th>
<th>Minimum Simultaneous Requirements to Achieve TRL based on NETL Interpretation of DOE Definitions &amp; Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>1</td>
<td>Basic principles observed and reported</td>
<td>Any experimentation is limited to discovery and validation of fundamental scientific principles. Formulation of the technology that applies the fundamental science is initiated in conceptual paper studies but experiments on the applied technology have not begun.</td>
</tr>
<tr>
<td>2</td>
<td>Technology concept and/or applications formulated</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Analytical and experimental critical function and/or characteristic proof of concept</td>
<td>Single Component</td>
</tr>
<tr>
<td>4</td>
<td>Component and/or system validation in laboratory environment</td>
<td>Total system or multi-component subsystem</td>
</tr>
<tr>
<td>5</td>
<td>Laboratory scale, similar system* validation in relevant environment</td>
<td>Total system (The total system is equivalent to the “TRA System,” which is the system or subsystem for which technology readiness is being assessed)</td>
</tr>
<tr>
<td>6</td>
<td>Engineering/pilot-scale, similar (prototypical) system validation in relevant environment</td>
<td>Total system</td>
</tr>
<tr>
<td>7</td>
<td>Full-scale, similar (prototypical) system demonstrated in relevant environment</td>
<td>Total system</td>
</tr>
<tr>
<td>8</td>
<td>Actual system completed and qualified through test and demonstration. Technology has been proven to work in its final form and under expected conditions.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Actual operation of the technology in its final form, under the full range of conditions.</td>
<td></td>
</tr>
</tbody>
</table>

* The DOE TRL 5 description states that the “similar system” matches the final application in “almost all respects” and is “almost prototypical.” This table interprets the similar, but not fully prototypical, system as being either: a) the total system for which readiness is being evaluated, or b) a multi-component subsystem of the total system. This interpretation is supported by the DOE TRL 6 description which states that “TRL 6 begins true engineering development of the technology as an operational system.”

** DOE defines TRL 6 as a pilot-scale prototype and TRL 7 as a full-scale prototype. DOE defines TRLs 8 and 9 as involving “actual” systems at full scale. This table assumes that the scale of the TRL 7 full-scale prototype could be less than or equal to the scale of the TRL 8 full-scale actual system. At a minimum, the scale of the TRL 7 prototype must be sufficiently large to support subsequent testing of a TRL 8 full-scale actual system without the need for testing at an intervening scale.
3.3 **Description of DOE Technology Readiness Levels**


<table>
<thead>
<tr>
<th>Relative Level of Technology Development</th>
<th>TRL</th>
<th>TRL Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Operations</td>
<td>9</td>
<td>Actual system operated over the full range of expected mission conditions.</td>
<td>The technology is in its final form and operated under the full range of operating mission conditions. Examples include using the actual system with the full range of wastes in hot operations.</td>
</tr>
<tr>
<td>System Commissioning</td>
<td>8</td>
<td>Actual system completed and qualified through test and demonstration.</td>
<td>The technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental testing and evaluation of the system with actual waste in hot commissioning. Supporting information includes operational procedures that are virtually complete. An Operational Readiness Review (ORR) has been successfully completed prior to the start of hot testing.</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Full-scale, similar (prototypical) system demonstrated in relevant environment</td>
<td>This represents a major step up from TRL 6, requiring demonstration of an actual system prototype in a relevant environment. Examples include testing full-scale prototype in the field with a range of simulants in cold commissioning (1). Supporting information includes results from the full-scale testing and analysis of the differences between the test environment, and analysis of what the experimental results mean for the eventual operating system/environment. Final design is virtually complete.</td>
</tr>
</tbody>
</table>

continued on next page
<table>
<thead>
<tr>
<th>Relative Level of Technology Development</th>
<th>TRL</th>
<th>TRL Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Demonstration</td>
<td>6</td>
<td>Engineering/pilot-scale, similar (prototypical) system validation in relevant environment</td>
<td>Engineering-scale models or prototypes are tested in a relevant environment. This represents a major step up in a technology’s demonstrated readiness. Examples include testing an engineering scale prototypical system with a range of simulants. Supporting information includes results from the engineering scale testing and analysis of the differences between the engineering scale, prototypical system/environment, and analysis of what the experimental results mean for the eventual operating system/environment. TRL 6 begins true engineering development of the technology as an operational system. The major difference between TRL 5 and 6 is the step up from laboratory scale to engineering scale and the determination of scaling factors that will enable design of the operating system. The prototype should be capable of performing all the functions that will be required of the operational system. The operating environment for the testing should closely represent the actual operating environment.</td>
</tr>
<tr>
<td>Technology Development</td>
<td>5</td>
<td>Laboratory scale, similar system validation in relevant environment</td>
<td>The basic technological components are integrated so that the system configuration is similar to (matches) the final application in almost all respects. Examples include testing a high-fidelity, laboratory scale system in a simulated environment with a range of simulants and actual waste. Supporting information includes results from the laboratory scale testing, analysis of the differences between the laboratory and eventual operating system/environment, and analysis of what the experimental results mean for the eventual operating system/environment. The major difference between TRL 4 and 5 is the increase in the fidelity of the system and environment to the actual application. The system tested is almost prototypical.</td>
</tr>
<tr>
<td>Technology Development</td>
<td>4</td>
<td>Component and/or system validation in laboratory environment</td>
<td>The basic technological components are integrated to establish that the pieces will work together. This is relatively &quot;low fidelity&quot; compared with the eventual system. Examples include integration of ad hoc hardware in a laboratory and testing with a range of simulants and small-scale tests on actual waste. Supporting information includes the results of the integrated experiments and estimates of how the experimental components and experimental test results differ from the expected system performance goals. TRL 4-6 represent the bridge from scientific research to engineering. TRL 4 is the first step in determining whether the individual components will work together as a system. The laboratory system will probably be a mix of on hand equipment and a few special purpose components that may require special handling, calibration, or alignment to get them to function.</td>
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</tbody>
</table>

continued on next page
<table>
<thead>
<tr>
<th>Relative Level of Technology Development</th>
<th>TRL</th>
<th>TRL Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research to Prove Feasibility</td>
<td>3</td>
<td>Analytical and experimental critical function and/or characteristic proof of concept</td>
<td>Active research and development (R&amp;D) is initiated. This includes analytical studies and laboratory-scale studies to physically validate the analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative tested with simulants. (1) Supporting information includes results of laboratory tests performed to measure parameters of interest and comparison to analytical predictions for critical subsystems. At TRL 3 the work has moved beyond the paper phase to experimental work that verifies that the concept works as expected on simulants. Components of the technology are validated, but there is no attempt to integrate the components into a complete system. Modeling and simulation may be used to complement physical experiments.</td>
</tr>
<tr>
<td>Basic Technology Research</td>
<td>2</td>
<td>Technology concept and/or application formulated</td>
<td>Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are still limited to analytic studies. Supporting information includes publications or other references that outline the application being considered and that provide analysis to support the concept. The step up from TRL 1 to TRL 2 moves the ideas from pure to applied research. Most of the work is analytical or paper studies with the emphasis on understanding the science better. Experimental work is designed to corroborate the basic scientific observations made during TRL 1 work.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Basic principles observed and reported</td>
<td>This is the lowest level of technology readiness. Scientific research begins to be translated into applied R&amp;D. Examples might include paper studies of a technology’s basic properties or experimental work that consists mainly of observations of the physical world. Supporting Information includes published research or other references that identify the principles that underlie the technology.</td>
</tr>
</tbody>
</table>

1 Simulants should match relevant chemical and physical properties.
2 Testing with as wide a range of actual waste as practicable and consistent with waste availability, safety, ALARA, cost and project risk is highly desirable.
APPENDIX L – COMMUNITY BENEFITS PLAN REQUIREMENTS

For projects funded under the Bipartisan Infrastructure Law, Applicants are asked to submit a Community Benefits Plan in line with other Bipartisan Infrastructure Law efforts. The Community Benefits Plan includes Quality Jobs; DEIA; Justice40 Initiative; and Community, Labor, and Stakeholder Engagement work, and uses standard language to help Applicants applying for multiple programs. Provided below are the requirements for Applicants to include in the Community Benefits Plan at the time of submission. As a reminder, these plans will be evaluated under Technical Review Criteria 4, and Applicants are asked to include work relevant to each plan within the Statement of Project Objectives (SOPO). For each plan, the Applicant should include at least one SMART (Specific, Measurable, Assignable, Relevant and Timely) milestone a calendar year for reporting on work relevant to it in the SOPO. This work should include success measurement metrics for plan actions.

- During the first 90 days of award, DOE will work with awardees to update the Plans and Plan Development Proposals, which can include new impacts, metrics, and ways of processing the information.
- Justice40 Initiative and Engagement Plan Development Proposals should be updated at 90 days, and full plans submitted 90 days subsequent to that.
- The Applicant should allocate staff time and budget for at least one team member to present in person on project work related to the Community Benefits Plan at a public meeting convened with support of the DOE. Applicants will present a Mid-Project Update on societal considerations and impacts which will be part of peer review.
- A public End-of-Project Progress Report on societal considerations and impacts is required, which covers the final Community Benefits Plan, accomplishments, and findings. It will be included in the project’s overall final report.

Quality Jobs Plan

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

The Quality Jobs Plan must describe the Applicant’s human resources approach to investing in workforce education and training of both new and incumbent workers and ensuring jobs are of sufficient quality to attract and retain skilled workers in the industry.

Specific components of the Plan must include:

1) A summary of the Applicant’s plan to attract, train, and retain a skilled and well-qualified workforce for both construction and ongoing operations/production activities. A collective bargaining agreement, project labor
agreement, labor-management partnership, or other similar agreement would provide evidence of such a plan. Alternatively, Applicants may describe:

a) wages, benefits, and other worker supports to be provided;

b) commitments to support workforce education and training, including measures to reduce employee turnover costs for employers, increase productivity from a committed and engaged workforce, and promote a nimble, resilient, and stable workforce for the project; and

c) efforts to engage employees in the design and execution of workplace safety and health plans.

2) Describe whether workers can form and join unions of their choosing, exercising collective voice. Employees’ ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them contributes to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits.

The Quality Jobs Plan portion of the Community Benefits Plan is recommended to be no longer than 5 pages.

**Diversity, Equity, Inclusion, and Accessibility (DEIA) Plan**

Elements of the DEIA plan to include are:

1. **Background.** Describe prior and ongoing efforts by members of the project team relevant to DEIA, based on findings from an initial assessment that examines the context of DEIA in organizations related to the project team.

2. **Milestones and Timelines.** The DEIA Plan should describe targeted DEIA outcomes and implementation strategies, including milestones, and should include a DEIA Plan schedule for execution. See guidance for more details on what this could involve.

3. **Resource Summary.** Describe project resources dedicated to implementing the plan including staff, facilities, capabilities, and budget that will support implementing the plan. The application should include information about:

   - **Staff:** The number of staff, their time on the project and their educational qualifications and experience (e.g., people trained in DEIA, facilitation, and/or social science).
   - **Facilities, equipment, and capabilities:** Physical buildings and meeting spaces, specialized equipment for use in research, scientific, and DEIA work, and/or the abilities staff, facilities, and equipment enable for the project.
   - **Budget:** Planned federal and/or project cost share aligned with activities in the plan.
Applicants are encouraged to organize the plan in a way that makes sense for the people in the project / organization and will be read by them. See guidance for more information and examples on creating a DEIA plan.

The DEIA Plan portion of the Community Benefits Plan is recommended to be no longer than 5 pages.

**Justice40 (J40) Initiative Plan**

The J40 Plan describes plans to address energy and environmental justice concerns, which will maximize the likelihood of successful projects. There are two parts to the J40 plan. Part 1 is an Energy and Environmental Justice Assessment (EEJ Assessment), which assesses project benefits and impacts. Part 2 is the Justice40 Implementation Strategy section, which explains what actions the Applicants will take to maximize benefits and minimize negative impacts. While meaningful engagement with impacted communities is a key component of environmental justice, this is covered in detail as part of the community, labor, and stakeholder engagement plan. If the applying organization and/or team has prior or ongoing efforts to advance environmental and energy justice, Applicants are encouraged to discuss how their J40 Plan incorporates lessons learned and builds on these prior/ongoing efforts.

The J40 Plan is required regardless of whether or not a project or work site is located within a disadvantaged community. Because the Justice40 Initiative includes a broad range of benefits that may accrue across many locations, Applicants must describe potential to minimize and mitigate negative impacts on disadvantaged communities, even if the project work site(s) itself is not located in or near a disadvantaged community.

AOI-1 and AOI-2 ask for a J40 Plan Development Proposal that will scope the resources that will be required to create this plan, and describe their strategy for making it.

J40 Plan Development Proposals should include the following elements:

1. A **preliminary Energy and Environmental Justice Assessment** that includes an analysis of communities, including disadvantaged communities, that will be affected by the project. This can be accomplished by using environmental justice screening tools and DOE’s working definition of disadvantaged communities (further described in guidance documents). The assessment should also offer a brief summary of benefits and impacts, including negative impacts, that can be anticipated based on prior experience or readily available data. Some of this may be known from other permitting requirements or similar projects.

2. A **description of research** that will need to be done to develop a detailed plan, including scoping data sources for incorporation into the plan (existing data sources as well as datasets that need to be developed).

3. A **timeline** for developing the plan, including appropriate milestones.
4. A description of personnel who will work on the plan, including trainings or qualifications that may need to be acquired.

5. An estimate of financial resources required for developing the plan.

6. A description of any community partners who may be interested in collaborating on or learning about the plan.

The J40 Plan Development Proposal portion of the Community Benefits Plan is recommended to be no longer than 4 pages. Recipients will be required to update the J40 Plan Development Proposal within 90 days of award.

Recipients will be required to develop a full J40 Plan within 90 days of submitting the updated J40 Plan Development proposal, as described below. The J40 Plan is recommended to be a maximum of 10 pages.

Part 1: Energy and Environmental Justice Assessment (EEJ Assessment)
Elements include:

1. An assessment of impacted communities and groups. Applicants must describe the applicable communities which could experience project impacts. Applicants should identify which of these are considered disadvantaged communities per DOE’s working definition of Disadvantaged Communities, and characterize the existing burdens they are facing using EJScreen or other analytic tools. Impacts to communities and Tribes/Alaska Native Corporations (ANCs) should be considered for inputs and outputs along the full lifecycle of the project and facility, in addition to impacts at the project site(s) or work location(s).

2. An assessment of project benefits and where they flow. Applicants must describe in detail anticipated project benefits. This description must clearly enumerate: a) specific project benefits, including to the greatest extent possible metrics that will be used to track these benefits; b) where/to whom project benefits are expected to flow and the extent to which these benefits flow to disadvantaged communities; and c) describe how well the anticipated project benefits and impacts align with community priorities. Have community-based organizations or relevant groups identified community priorities that align, or do not align, with project benefits? Benefits should be quantifiable, measurable, and trackable to the greatest extent possible; it is expected that Applicants include qualitative alongside quantitative benefits. Please see guidance for more details on what might be a benefit and how to assess it.

3. An assessment of project disbenefits/harms, and any other impacts not included under “benefits.” Applicants must describe anticipated project disbenefits/harms, or other impacts not include under “benefits”. Negative impacts could include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health impacts. Consider direct impacts, indirect impacts, and cumulative impacts. Negative impacts should be
quantifiable, measurable, and trackable to the greatest extent possible; it is expected that Applicants include quantifiable alongside qualitative metrics. Please also discuss whether disadvantaged communities will experience disbenefits/harms disproportionately and how additional project disbenefits/harms will interact with existing cumulative burdens. Please see guidance for more details on what might be a disbenefit and how to assess it.

4. Assessment of information gaps: For elements of the EEJ Assessment where additional work is needed to fully assess or measure potential project impacts or impacted communities, Applicants can outline research and analytical goals to clarify the unknowns.

Part 2: Justice40 Implementation Strategy

The J40 Implementation Strategy will outline concrete steps the Applicant will take to maximize benefits, minimize negative impacts, and measure, track, and report project impacts.

It should include the following elements that build on the EEJ Assessment and may include additional elements as appropriate:

5. Background: A brief narrative summary of the opportunities and risks related to energy and environmental justice in the project.

6. Milestones and Timelines: Applicants should develop a schedule which includes when and how work in the J40 Plan will be conducted. The J40 Plan schedule should define its timeline on the same schedule as the Project Management Plan. It is expected that pivotal points in the Engagement plan’s schedule will also be included in the Project’s SOPO. This includes project milestones for maximizing benefits and minimizing negative impacts; milestones to measure, track, and report project impacts; updates to the EEJ assessment; and future work. See guidance for further details and examples of what might go into this section.

7. Assessment of risks to realizing benefits and minimizing negative impacts: For items outlined in the EEJ Assessment, discuss potential risks to realizing project benefits, minimizing negative impacts, and plans for mitigating those risks.

8. Resource Summary: Describe project resources dedicated to implementing the J40 Plan including staff, facilities, capabilities, and budget that will support implementing the Plan.

Community, Labor, and Stakeholder Engagement Plan

Community, Labor, and Stakeholder Engagement Plans set forth the Applicant’s plans for engaging with stakeholders, Tribes/ANCs, and community-based organizations representing local residents and businesses, labor unions and worker organizations, local government,
emergency responders, and communities with environmental justice concerns. Community and labor engagement should lay the groundwork for the eventual negotiation of a Workforce and Community Agreement, which could take the form of one or more kinds of negotiated agreements with affected communities, such as Community Benefits Agreements, Project Labor Agreements, or others. If awarded and in conjunction with DOE, awardees will also identify to DOE any federally recognized Indian tribes, including Alaska native village or regional or village corporations (who are not project partners) for whom the proposed project may have implications. The awardee will provide information to support DOE’s development of a Tribal engagement plan that acknowledges each Tribe’s consultation policies, traditions, and expectations, and adheres to DOE Order 144.1 on Tribal consultation, to identify appropriate mitigation through government-to-government consultation to off-set any such potentially adverse implications. DOE is and remains responsible for government-to-government consultation with any federally recognized Indian tribes, including Alaska native village or regional or village corporations about the proposed project.

Please note that AOI-1 and AOI-2 only require an Engagement Plan Development Proposal that will scope the resources that will be required to create this plan and describe the Applicant’s strategy for making it.

Engagement Plan Development Proposals should include the following elements:

1. A description of prior engagement efforts by the project team (in other words, the first element of the Plan)
2. A description of research that will need to be done to develop a detailed plan, including scoping data sources for incorporation into the Plan (existing data sources, as well as datasets that need to be developed)
3. A timeline for developing the plan
4. A description of personnel who will work on the Plan, including training or qualifications that may need to be acquired
5. An estimate of financial resources required for developing the Plan
6. A brief discussion of resources, references, or community partners that will be useful in developing the Plan

The Engagement Plan Development Proposal portion of the Community Benefits Plan is recommended to be no longer than 4 pages. Recipients will be required to update the Engagement Plan Development Proposal within 90 days of award.

Recipients will be required to develop a full Engagement Plan within 90 days of submitting the updated Engagement Plan Development proposal, as described below. The full Engagement Plan is recommended to be a maximum of 10 pages.

The Engagement Plan should include the following elements and may include additional elements as appropriate.
1. **Background.** A description of prior and ongoing efforts by members of this project team to engage communities and stakeholders relevant in this proposed project.

2. **Social Characterization Assessment.** This involves a brief writeup of community dynamics and decision-making processes (see guidance for more information and resources).

3. **Initial Stakeholder Analysis Summary.** A description of how stakeholders were identified; which sectors, communities, organizations, etc. the stakeholders represent; and their current or anticipated level of engagement (e.g. advisory committee, working group member, active public participant, etc.). Include an assessment of existing community support for and/or opposition to this project, including a description of steps taken to gather this information.

4. **Engagement Methods and Timeline.** Applicants should develop an Engagement Plan schedule which includes when and how they will engage stakeholders, communities, and Tribal nations, as well as the objectives for the engagement. Methods, which could include activities like listening sessions, town halls, open houses, mediated discussions, and more (see guidance) should be matched to project phase and goals. The Engagement Plan schedule should define its timeline on the same schedule as the Project Management Plan, with pivotal points in the Engagement plan’s schedule to be included in the Project’s SOPO.

5. **Two-way Engagement Statement.** This statement should include discussion of how the project incorporates principles of consent-based siting and the extent to which the host community or communities have already given consent for the siting of a REE Demonstration Facility. The statement should list the points in the project where engagement can impact project decisions or project characteristics, including a discussion of whether there is a pathway for the project to consider changing target site based on social considerations. More information on how to craft the Two-Way Engagement Statement can be found in the guidance.

6. **Project Agreements Statement.** A brief statement describing any plans to negotiate a Workforce & Community Agreement (including a Community Benefits Agreement, Good Neighbor Agreement, Project Labor Agreement, Community Workforce Agreement, and/or other collective bargaining agreements, or similar agreement). Such agreements facilitate community input and social buy-in, identify how concerns will be mitigated, and specify the distribution of community benefits, including access to jobs and business opportunities for local residents, thus reducing or eliminating project risks.

7. **Engagement Evaluation Strategy.** A description of plans for activities to evaluate the success of engagement, including evaluating community and stakeholder perceptions of the progress.

8. **Resource Summary.** Describe project resources dedicated to implementing the plan including staff, facilities, capabilities, and budget that will support implementing the plan.
## APPENDIX M – LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AACE</td>
<td>Association for the Advancement of Cost Engineering</td>
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<tr>
<td>A/E</td>
<td>Architectural and Engineering</td>
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<tr>
<td>AMD</td>
<td>Acid Mine Drainage</td>
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<td>ANCIs</td>
<td>Alaska Native Corporations</td>
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<td>AOI</td>
<td>Areas of Interest</td>
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<tr>
<td>BIL</td>
<td>Bipartisan Infrastructure Law</td>
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<td>CEP</td>
<td>Chemical Extraction and Purification</td>
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<td>CFO</td>
<td>Chief Financial Officer</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>CM</td>
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<td>Critical Minerals and Materials</td>
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<td>CRADA</td>
<td>Cooperative Research and Development Agreement</td>
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<td>DBA</td>
<td>Davis-Bacon Act</td>
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<tr>
<td>DEC</td>
<td>Determination of Exceptional Circumstances</td>
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<tr>
<td>DEIA</td>
<td>Diversity, Equity and Inclusion, and Accessibility</td>
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<td>DMP</td>
<td>Data Management Plan</td>
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<tr>
<td>DOE</td>
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<td>EEJ</td>
<td>Energy and Environmental Justice</td>
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<td>EIS</td>
<td>Environmental Impact Statement</td>
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<td>First-of-a-Kind</td>
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<td>FONSI</td>
<td>Finding Of No Significant Impact</td>
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<td>GAAP</td>
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<td>HREEs</td>
<td>Heavy Rare Earth Elements</td>
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<td>Infrastructure Investment and Jobs Act</td>
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<td>IP</td>
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<td>IRB</td>
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<td>ISHP</td>
<td>Individually Separated High Purity</td>
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<td>J40</td>
<td>Justice40 Initiative</td>
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<td>LCA</td>
<td>Lifecycle Analysis</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>LREEs</td>
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<td>MESC</td>
<td>Office of Manufacturing &amp; Energy Supply Chains</td>
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<td>MPIN</td>
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<tr>
<td>MREO/MRES</td>
<td>Mixed Rare Earth Oxides/Salts</td>
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<td>MSI</td>
<td>Minority-Serving institution</td>
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<tr>
<td>MYPP</td>
<td>Multi-Year Program Plan</td>
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<td>NEPA</td>
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<td>NETL</td>
<td>National Energy Technology Laboratory</td>
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<td>NNSA</td>
<td>National Nuclear Security Agency</td>
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<tr>
<td>O&amp;M</td>
<td>Operation and Maintenance</td>
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<td>OEM</td>
<td>Original Equipment Manufacturer</td>
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