Department of Energy (DOE)

Office of Energy Efficiency and Renewable Energy (EERE)

Clean Energy Manufacturing Innovation Institute: Cybersecurity in Energy Efficient Manufacturing

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Informational Webinar:	April 16, 2019 1:00 pm ET
Submission Deadline for Concept Papers:	May 15, 2019 5:00 pm ET
Submission Deadline for Full Applications:	August 20, 2019 5:00pm ET
Expected Submission Deadline for Replies to Reviewer Comments:	September 26, 2019 5:00pm ET
Expected Date for EERE Selection Notifications:	December 2019
Expected Timeframe for Award Negotiations:	120 days

- Applicants must submit a Concept Paper by 5:00pm ET the due date listed above to be eligible to submit a Full Application.

- To apply to this FOA, applicants must register with and submit application materials through EERE Exchange at https://eere-Exchange.energy.gov, EERE's online application portal.

- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations. If an application is selected for award negotiations, it is not a commitment to issue an award. It is imperative that the applicant/selectee be responsive during award negotiations and meet negotiation deadlines. Failure to do so may result in cancelation of further award negotiations and rescission of the Selection.

Modifications

All modifications to the FOA are [HIGHLIGHTED] in the body of the FOA.

Mod. No.	Date	Description of Modification
0001	5/2/2019	1. Added the following text and corresponding footnote link to Section I.A.v., "DOE intends to only fund work that is complementary to and not duplicative of existing DOE and other Manufacturing Innovation Institutes" (page 8). 2. Changed the Statement of Project Objectives page limit from 50 to 40 in Section IV.D.i. (page 35).
0002	8/12/2019	1. Added the following text to Section VI.B.xv., "It must also address how the recipient will ensure compliance with the restrictions on participation in foreign government talent recruitment programs. See Section VI.B. xxiii" (page 75). 2. Added xxiii. "Foreign Government Talent Recruitment Programs" and corresponding text to Section VI.B. (pages 79-81). 3.Added the following text to Appendix C – Key Elements of a Conflict of Interest (COI) Plan #11, "These disclosures should also include any participation in foreign government talent recruitment program of a foreign country of risk" (page 96).

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I. Funding Opportunity Description

A. Context for an Institute Advancing Cybersecurity in Energy Efficient Manufacturing

i. Cybersecurity in Energy Efficient Manufacturing Purpose

Through this Funding Opportunity Announcement (FOA), the Office of Energy Efficiency and Renewable Energy (EERE), in partnership with the Office of Cybersecurity, Energy Security and Emergency Response (CESER), seeks to establish a Clean Energy Manufacturing Innovation Institute dedicated to advancing cybersecurity in energy efficient manufacturing (referred hereafter as the Institute). The Institute will pursue targeted research and development (R&D) that will focus on understanding the evolving cybersecurity threats to greater energy efficiency in manufacturing industries, developing new cybersecurity technologies and methods, and sharing information and knowledge to the broader community of U.S. manufacturers. The Institute will leverage expertise from industry, academia, state and local governments, Non-Governmental Organizations (NGOs), non-profits and Federally Funded Research and Development Centers (FFRDCs).

Specifically, the Institute will:

- Achieve specific goals unique to cyber-secure process controls that enable greater manufacturing energy efficiency;
- Lead a national consortium in early-stage applied R&D for low-cost technologies and methods for reducing risk and improving cybersecurity preparedness, response, and recovery;
- Establish and support a shared R&D infrastructure to increase understanding of cybersecurity vulnerabilities and risks specific to manufacturing and to implement effective mitigations against them;
- Increase awareness and implementation of cybersecurity best practices for a more efficient manufacturing sector;
- Be a financially self-sustaining, world-leading innovation Institute that brings together private and public entities to co-invest in the R&D of technologies that can promote the security and economic resilience of U.S. manufacturing; and
- Establish a technical education and workforce development (EWD) program to support technical and career education that will leverage relevant existing resources to develop the skillsets needed for the workforce to manage and implement cyber-secure energy efficient approaches in manufacturing.

DOE, through EERE and CESER, will have substantial involvement in work performed under the award made as a result of this FOA. DOE does not limit its involvement to the administrative requirements of the award. Instead, DOE will have substantial involvement in the direction and redirection of the technical aspects of the project as a whole. DOE anticipates hands-on participation and involvement in the Institute. See Section VI.B.ix, Statement of Substantial Involvement, for more details.

ii. Technology Space and Strategic Goals

Manufacturing consumes approximately 25% of the energy in the U.S.[1] A critical path to improving energy efficiency for manufacturing is the implementation of advanced automation and control systems. A report on measurement and verification protocols from Lawrence Berkeley National Laboratory identifies an opportunity for 15% industrial energy efficiency improvements through secure process automation[2]. Cybersecurity challenges are broadly applicable across the manufacturing sector – including clean energy, semiconductors, and energy intensive industries for transportation equipment, petroleum refining, iron/steel, forest products, agriculture/food, and cement.

For the clean energy sector, cybersecurity threats negatively impact the manufacturing and deployment of clean energy technologies such as electric vehicles, solar panels, and wind turbines. Clean energy technologies draw from a wide pool of equipment and component suppliers. Compromised components can negatively impact the product output and pose potential future risks once the products are put into service and part of a connected network. Clean energy technologies often employ integrated approaches with a number of semiconductor components to improve energy efficiency. Cyber vulnerabilities introduced at a component level during the production process can have widespread and long-lasting negative impacts.

In addition to advanced automation and control systems, a transition to more electrified technologies is another path to improving the energy efficiency of manufacturing – making manufacturers more efficient and competitive. Electrified technologies can include innovative technologies to reduce process heating energy requirements as well as alternative designs and approaches that can require advanced sensors and controls to connect to an integrated network – exposing

[1] U.S. Energy Information Administration, Manufacturing Energy Consumption Survey 2014, Table 7.9 Expenditures for Purchased Energy Sources. https://www.eia.gov/consumption/manufacturing/data/2014/#r9.

[2] Granderson, J, Fernandes S, 2017. State of Advanced Measurement and Verification Technology and Industry Application The Electricity Journal 30 8-16. https://eta.lbl.gov/sites/default/files/publications/sam_fernandes_-_report_-_state_of_advanced_measurement_and_verification_technology_and_industry_application_0.pdf

manufacturers to increased cybersecurity threats. A key enabler for these energy saving advances is the development and adoption of more secure technologies.

It is also critical that the latest information about newly discovered vulnerabilities and mitigations be shared with relevant industry parties in a timely manner. Coordinated Vulnerability Disclosure (CVD) is one process of investigating and disclosing vulnerability information between a third-party and the impacted organizations in a way that minimizes harm to society[3]. CVD activities have been recognized as "an indispensable cornerstone" of contemporary cybersecurity. Vigorous and standardized CVD activities are needed to maintain an active and open cybersecurity community.

Expansion of the workforce to address the shortage of cybersecurity practitioners and enhancing the skillset of the workforce is also critical to meet the growing cyber threats.[4] Cybersecurity field training and on the job training are particularly important due to the rapidly developing nature of cyber issues and specialized applications. Training needs for industry include awareness, improvement in cybersecurity knowledge, and implementation from the technician to C-level suite. Real world requirements and rapid advances need to be integrated into curriculum and courses at the community college, undergraduate, and graduate level. Training and education needs to emphasize design that considers how real-world security is implemented and equipment is used. Cutting edge education tools such as virtual training labs can also be leveraged.

DOE identified two major high priority challenge areas that the manufacturing sector faces, where collaborative R&D can help U.S. manufacturers remain resilient against cyberattacks and competitive in global markets as they improve energy efficiency: 1. Securing Automation and 2. Securing the Supply Chain Network. Institute activities in both areas should address the design, installation, operation and maintenance of technological solutions.

iii. Securing Automation

Within the manufacturing industry automated systems are typically limited to single units of equipment or connected systems within a small number of manufacturing facilities. Current systems have fragmented automation and control systems, interfaces, and system drives which pose significant security threats.

[3] Allen D. Householder et al., *The CERT® Guide to Coordinated Vulnerability Disclosure*, SOFTWARE ENGINEERING INSTITUTE | CARNEGIE MELLON UNIVERSITY 9 (2017), https://resources.sei.cmu.edu/asset_files/SpecialReport/2017_003_001_503340.pdf.

[4] Council on Competitiveness, Secure. Ensuring Resilience & Prosperity in a Digital Economy.

As manufacturers consider connecting to extended supply chain networks, they need to improve automation, control systems, and interfaces. Many manufacturers lack the necessary capability to do this without significantly increasing their exposure to cybersecurity vulnerabilities.

Challenges facing the manufacturing sector to advance secure manufacturing and enhance energy efficiency and productivity include (but are not limited to):

- Advancing machine monitoring for connectivity and threats;
- Innovating or furthering specific controls for risk identification and mitigation;
- Streamlining specific manufacturing processes with actionable intelligence and intrusion alerts;
- Integrating multiple levels of security screening to qualify parts or components; and
- Furthering technical innovations to develop the next-generation of secure, open control systems and interfaces.

Cyber-attacks on industrial infrastructure, especially industrial control systems (ICS), can compromise the integrity of manufacturing assets (manufacturing systems, machine tools, machine parts or components), reducing manufacturing productivity, and increasing costs. With increased automation and software-based control as well as monitoring of manufacturing assets across networks, the risk of cyberattacks also grows[5].

Robust manufacturing networks based on trusted control systems and interfaces, efficient data modeling methods, advanced computing, and strong cybersecurity frameworks are needed. Robust component and material validation is also necessary to ensure the integrity of manufacturing systems, machine tools, machine parts and components. Validation and verification of manufactured products must include the ability to differentiate between internal manufacturing defects and those caused by cyberattacks.

There are many security related technological innovations already happening in the area of secure automation. Security frameworks specifically integrating machine learning (ML), artificial intelligence (AI), and augmented reality are all poised to disrupt the manufacturing industry. One of the inherent challenges is the need for manufacturers to understand cybersecurity, balance the advantages of increased automation with the additional cyber-risks that are introduced, and mitigate those risks where possible.

[5] https://cra.org/ccc/wp-content/uploads/sites/2/2017/10/MForesight-Cybersecurity-Report.pdf

Technical innovations in this area should address:

- Cyber vulnerabilities in automated process control systems for manufacturing equipment, tools, or components;
- Secure communication, including encryption capabilities, for smart and digital manufacturing to include machine learning and machine-to-machine communication;
- Computing architectures and hardware customized for cybersecurity;
- Capabilities for identifying, alerting, and mitigating cybersecurity threats in automated manufacturing systems that enable greater energy efficiency; and
- CVD capabilities to improve the safety and security of the advanced manufacturing and energy intensive industries.

iv. Securing the Supply Chain Network

Secure and resilient supply chain networks are critical for manufacturers to remain competitive. A major challenge for the manufacturing sector is the need for improving resiliency of the supply chain network against emerging cyber-threats while balancing demand, consumption of resources, and production of goods. Since manufacturers and the manufacturing supply chain networks can be negatively impacted by cyber-attacks on products and materials at any point between design and use (not only on the factory floor), it is difficult for an individual manufacturer to address challenges across their ecosystem.

The complex and interdependent supply chain ecosystems of today's global economy means that in many cases the product of one manufacturer is the input/component for another manufacturer. Vulnerabilities in any part of the supply chain network introduces risk to the manufacturing process. On demand production approaches, additive manufacturing strategies, clean energy technologies, semiconductors, and energy intensive industries manufacturing areas can all benefit from stronger integration across the supply chain network. Challenges manufacturers face in the supply chain network include (but are not limited to):

- Verification and validation of authenticity of materials and components against counterfeit and off-specification materials;
- Physical tracking and anti-tampering strategies for components and inventories throughout the supply chain network;
- Secure and efficient communication between suppliers and customers at all levels of the supply chain;
- Protecting data and IP from exposure and theft;
- Integration of a multitude of systems that vary in age, sophistication, and architecture; and

- Analysis and modeling of the widely diverse systems, equipment, and processes across the supply chain network.

Innovation and R&D is needed to realize secure integration and management of capital assets. To truly provide comprehensive security for the manufacturing sector, supply chain network security is essential.

Technical innovations in this area should address:

- Security for agile on-demand, dynamic, energy-aware and cost-effective supply chain networks;
- Standardization of security protocols, architectures and networking infrastructure that promote greater energy efficiency;
- Autonomy of connected process controls for manufacturing systems with secure asset and energy management;
- Supply chain centric real-time prescriptive data analytics for security threats, reduction and mitigation; and
- Security related supply chain network efficiency.

v. Institute Organization, Structure, and Operations

EERE funds Manufacturing Innovation Institutes as part of an effort to strengthen U.S. manufacturing competitiveness by developing advanced, energy-efficient technologies.[6] Manufacturing Innovation Institutes are designed to bring together industry, academia, state and local governments, NGOs, non-profits and national laboratories, to:

- Accelerate manufacturing innovation by investing in industry-relevant, cross-cutting product and process technologies;
- Provide education and training opportunities to build and enhance the skills of the American manufacturing workforce; and
- Transition to a privately funded model approximately 5 years after launch (also referred to as “self-sustaining”).

Through shared infrastructure and capabilities, an Institute enables development, validation, and verification of advanced manufacturing technologies while addressing key technical and engineering challenges for U.S. manufacturing.

Each Institute is expected to:

- Foster an open exchange of pre-competitive manufacturing best-practices and know-how;
- Protect intellectual property;

[6] U.S. Department of Energy. Clean Energy Manufacturing Initiative website. http://energy.gov/eere/cemi/about-clean-energy-manufacturing-initiative

- Allow manufacturers of all sizes access to and use of the shared R&D infrastructure for research, development, validation, and verification;
- Provide the opportunity for its members to improve their own technologies by learning from other members;
- Engage the manufacturing community at all levels of the supply chain network, from technology developers to implementers to users, including industry, academia, state and local governments, NGOs, non-profits, national laboratories, and FFRDCs to transition relevant advanced manufacturing technologies to commercial applications;
- Focus on problems relevant to manufacturing[7];
- Engage with the broader community by hosting research internships and developmental assignments for individuals from industry, academia, and government to accelerate pre-competitive development of advanced manufacturing technologies;
- Support technical, educational, and workforce development of the energy efficient manufacturing community around the Institute and the associated new technologies developed and implemented;
- Have a strong management team and a strong organizational director; and
- Have a clearly defined governance structure, and well-defined operational plan to enable efficient operations that demonstrate value to Institute stakeholders.

To date, AMO has established five Manufacturing Innovation Institutes[8,9]:

- PowerAmerica is focused on wide bandgap semiconductor technologies for next generation power electronics[10];
- Institute for Advanced Composites Manufacturing Innovation (IACMI) is focused on composite manufacturing technologies for vehicles, wind turbine blades, and compressed gas storage tanks[11];
- Clean Energy Smart Manufacturing Innovation Institute (CESMII) is focused on advanced process controls and sensors at manufacturing facilities[12];

[7] Manufacturing USA (MUSA) website: https://www.manufacturingusa.com/
[8] U.S. Department of Energy. Advanced Manufacturing Office website: http://energy.gov/eere/amo/advanced-manufacturing-office
[9] The Advanced Manufacturing Office (AMO) is a technology office within Energy Efficiency and Renewable Energy Office of the US Department of Energy. AMO is participant in the Clean Energy Manufacturing Initiative (CEMI) of EERE and DOE. AMO will be responsible in leading the establishment and management of federal sponsorship for this Manufacturing Innovation Institute.
[10] PowerAmerica website: http://energy.gov/eere/amo/power-america
[11] Institute for Advanced Composite Materials Innovation website: http://energy.gov/eere/amo/institute-advanced-composites-manufacturing-innovation
[12] Manufacturing Innovation Institute for Smart Manufacturing: https://www.energy.gov/eere/amo/clean-energy-smart-manufacturing-innovation-institute-cesmii

- Rapid Advancement in Process Intensification Deployment (RAPID) is focused on breakthrough technologies to dramatically improve the energy efficiency of novel manufacturing processes and enable development of modular processes[13]; and
- Reducing EMbodied-energy And Decreasing Emissions (REMADE) is focused on dramatically reducing the energy required to manufacture key materials and improve overall manufacturing energy efficiency through increased use of secondary materials.[14]

The FOA described within this document supports the establishment of DOE's sixth Institute and will be focused on the technical focus area of Cybersecurity in Energy Efficient Manufacturing.

DOE intends to select and fund one application with the greatest likelihood of achieving the goals of the two topic areas, described in Section I.B below. The applicant selected will negotiate one award with DOE for all Institute activities. DOE will be substantially involved in the management of the award and in the establishment and operations of the Institute, as described in Section VI.B.ix Statement of Substantial Involvement. In selecting an application, DOE may fund the full scope of an application or fund a portion of the project scope of an application at a funding level that will be negotiated with the applicant. DOE intends to only fund work that is complementary to and not duplicative of existing DOE and other Manufacturing Innovation Institutes[15].

vi. Performance Metrics and Institute Goals

The efforts of the Institute should provide significant impacts in developing technology that will improve the energy efficiency and cybersecurity of U.S. manufacturing. The Institute will need to use the developed Roadmap, described in Section I.B.iv Development of a Roadmap, to prioritize work. The Roadmap will outline the relevant activities to achieve the cybersecurity goals. Technology development and EWD efforts must be targeted towards the following performance metrics:

- Development of technologies that result in energy efficiency gains of 15% or more in manufacturing processes through secure process automation. The applicant should validate and verify how the process is more secure than existing state-of-the-art approaches. Solutions in energy intensive industries

[13] Manufacturing Innovation Institute for Modular Chemical Processing Intensification for Clean Energy: https://www.energy.gov/eere/amo/rapid-advancement-process-intensification-deployment-rapid-institute

[14] Clean Energy Manufacturing Innovation Institute for Reducing Embodied-energy And Decreasing Emissions (REMADE) in Materials Manufacturing: https://www.energy.gov/eere/amo/clean-energy-manufacturing-innovation-institute-reducing-embodied-energy-and-decreasing

[15] Manufacturing USA (MUSA) Insittutes website: https://www.manufacturingusa.com/institutes

or manufacturing processes with renewable and clean energy product outputs should be prioritized;

- Improvement of 50% or more in energy efficiency or speed (at equal energy efficiency) of specified cybersecurity solutions (and the total energy savings as a result);
- Quantified prevention of, or mitigation of, negative cybersecurity impact on manufacturing assets and output quality;
- Percentage improvements in mean time-to-detect as well as time-to-recover from cyber-attacks. The applicant should specify which industry and/or systems type, and provide a baseline mean time-to-detect and/or mean time-to-recover. Recovery success measures should be defined and justified by the applicant to be relevant to the specific industry;
- Reduction of 10% or more in a specific supply chain network activity energy use realized through cybersecurity technologies developed under this funding opportunity;
- Number of coordinated vulnerability disclosures by U.S. based manufacturers, including the number of solutions developed based on CVD actions. Applicants should explain how they will show that Institute actions link to measured CVDs;
- Number of trained workforce (college/university, graduate school, community colleges, industry);
- Number of certified coursework/curriculums developed; and
- Be financially self-sustaining at the end of the 5 year federal award project period.

The goals must be supported by credible analysis, with an explanation as to why the goals are relevant and impactful to U.S. manufacturing competitiveness. Selection rationale of baseline levels based on the current state of the art and the corresponding projected improvements over 10 years must be included. Applicants may propose additional or alternate metrics with clear justification and supporting analysis that clearly demonstrates achieving the goals of this FOA. The applicant must identify clear milestones (improvements in productivity or energy efficiency, cost improvement, performance improvement) and how the Institute will demonstrate progress towards the defined targets for the award project period at regular intervals, and show a path to achieve the long terms goals identified post award project period. For any and all proposed application areas, it is strongly encouraged to have end users from the relevant industries included in the Institute, demonstrating market pull and technical relevance for subsequent technology transfer and commercial adoption.

In addition to the performance metrics above, the Institute organizational and ecosystem goals must include:

- Establishment of an industrial consortium as a public-private partnership to enable cybersecurity technologies that increase U.S. manufacturing energy efficiency. This Institute must develop a Roadmap, an annual planning process to address new ideas and participants, and a path to self-sustainment in the sixth year of operation;
- Establishment of a robust industrial partnership and ecosystem for dissemination of information and adoption of cybersecure technologies in energy efficient manufacturing. This ecosystem should include a diverse mix of industries and member organizations.

B. Topic Areas and Institute Activities

Below is a more detailed description of the Institute's topic areas and the activities the Institute is expected to complete. Applicants will apply to the entire Institute FOA by submitting an application that addresses both of the topic areas. DOE intends to select and fund one applicant with the greatest likelihood of achieving the goals of the FOA. For a description of what should be included in an Institute application, see Section IV.D Content and Form of the Full Application.

Topic areas include: 1) Securing Automation, and 2) Securing Supply Chain Networks. Applicants are expected to develop their plan of work to address the progress they can make in both of these topic areas as a portfolio of activities within the Institute. Applicants are also expected to address education and workforce development in their plan of work for both topic areas. Other activities beyond those outlined below may be proposed, provided they are justified as being relevant to the Institute and its goals. All work under EERE funding agreements must be performed in the United States. See Section IV.J.iii and Appendix B.

i. Securing Automation

For secure automation, the R&D efforts will focus on improving security measures needed for integrating hardware and software systems that improve automation and efficiency in manufacturing, as well as developing automated diagnostics for manufacturing systems. Improving security of all manufacturing processes will also allow manufacturers to improve productivity, flexibility and connectivity. Control interfaces for manufacturing equipment, tools, or components is one area the Institute must address. In addition to other critical areas identified by applicants, the Institute must focus on:

- Developing advanced sensors for manufacturing process monitoring and control – Work here should address design and implementation of physical and software approaches to assess and ensure the security of these sensors.

- Developing countermeasures to emerging technologies being leveraged by adversaries across all sectors – These countermeasures can include both hardware and software solutions. Countermeasures considered should include not only control interfaces but also architectures, control systems, and other communication interfaces.
- Designing and developing advanced manufacturing technologies that include robust cybersecurity from the ground up – These advanced manufacturing technologies can be widely applicable or specific to an industry or process.

The need to secure automation spans securing the communication interfaces between equipment to enabling faster and more secure data transfer and analysis across plant locations and companies. Industry-driven open reference architectures, standards and protocols for various control systems (securing sensors, actuators, robots, controllers and databases) are important for enabling the next generation of cyber-secure manufacturing systems. Architectures and hardware design focused on and customized for cybersecurity are additional areas crucial to hardware and software integration for manufacturing automation. The goal of R&D efforts will be to avert cyber-attacks on industrial equipment, tools, and materials, including networked systems. In addition to other critical areas identified by applicants, the Institute must focus on:

- Developing security solutions for digital control systems that lead to greater energy efficiency – This work can include design, modeling and prototyping. Applicants are encouraged to consider Supervisory Control and Data Acquisition (SCADA) and open source control interfaces, for manufacturing equipment, tools, and materials.
- Improving the security of advanced analytics based on industry driven open reference architectures, standards and protocols – Advanced analytics enable automated and advanced manufacturing. Open source/reference approach is required to ensure widespread availability and applicability.
- Designing and implementing new secure control systems and integration of related hardware and software – This work can include prototyping or be limited to design and implementation plans. Such systems and integration can be process/industry specific or more widely applicable.
- Developing an industry driven cybersecurity and resiliency framework for network-centric manufacturing – Applicants should focus on a standard framework that can be as widely applicable as possible.
- Developing and implementing data privacy, encryption and standards for manufacturing process planning and information exchange – Work in this area must consider existing guidance and standards as well as industry wide input.

It is impossible to identify and eliminate all possible cybersecurity vulnerabilities when developing new energy efficient technologies. Identifying, alerting, and mitigating when cyber intrusions occur are thus instrumental in manufacturing resiliency and should be considered in any design and implementation approaches considered under all focus areas of automation. Additionally, improving abilities for third parties to work with manufacturers on detecting and disclosing information on vulnerabilities is essential. Institute efforts must include fostering increased and improved CVD activities through the development of guidelines, best practices, and more direct engagements. In addition to other critical areas identified by applicants, the Institute must focus on:

- Automation related threat identification, alerts and mitigation – This work should consider approaches that identify threats and intrusions as well as strategies for industry to mitigate problems.
- Knowledge bases focused on cyber vulnerabilities and detection of intrusions to common manufacturing systems – Such knowledge bases must consider effective documentation and communication as well as strategies to protect non-public information while balancing information sharing with U.S. manufacturers.
- Advanced behavioral anomaly detection for designing and manufacturing – Applicants should propose general detection strategies or innovation for specific processes/industries. Work could include designing and modeling as well as actual prototyping and testing.
- CVD guidelines, standards and education must be developed, at a minimum – Implementation and piloting of an industry-wide CVD program can also be considered. Any CVD program must include a process for documenting disclosures, reporting the disclosures to DOE, and a plan to share information with targeted organizations where appropriate.

ii. Securing Supply Chain Networks

R&D must consider all aspects of the manufacturing supply chain network –including those that span across multiple supplier tiers – for equipment, tools, and materials. Recent advances in modeling and simulation, machine learning, and AI can be leveraged to improve energy efficiency and performance across entire supply chain networks by reducing the risks and consequences of cyber threats. Supply chain security work proposed must allow for agile on-demand, dynamic, energy-aware and cost-effective ecosystems. Work must address autonomy for manufacturing systems with secure asset and energy management. In addition to other critical areas identified by applicants, the Institute must focus on:

- Integrating cybersecurity with energy and equipment management – Proposed work in this area can consider the hardware and software solutions required for energy and equipment management in the supply chain network.

- Improving equipment maintenance through secure status monitoring – Work can focus on hardware or software strategies for status monitoring that enables robust equipment maintenance. Such strategies should include the ultimate benefits of the maintenance in increasing efficiency and/or reducing cost.
- Securing manufacturing asset management tools across the supply network (including, but not limited to, between original equipment manufacturers (OEMs) and Tier1 and Tier 2 suppliers) – Applicants should propose hardware and software strategies that overcome the differences in systems traditionally experienced in the supply network.

The Institute's focus must include enabling a vibrant and comprehensively secure supply network that consists of large, small and medium enterprises distributed across the U.S. The Institute must also focus on supporting efforts to identify, fix, and raise awareness of cyber-vulnerabilities across supply chain networks. Software, vulnerability detection and mitigation activities must include standards, CVD, and other activities. Additionally, the Institute must address the standardization of security protocols, architectures, and networking infrastructure as appropriate to overcome the barrier of these historically incongruent systems. Real-time data analytics in the supply chain network for security threat discovery, detection, disclosure, and mitigation must be addressed. Innovation in the security requirements of efficiency in the supply chain network must also be considered. In addition to other critical areas identified by applicants, the Institute must focus on:

- Enabling secure energy efficient manufacturing services and maintenance across the supply network – Securely implementing emerging approaches and theories on supply chain network-wide servicing and maintenance that consider the entire supply network should be addressed;
- Developing and implementing approaches for testing the cybersecurity framework to address the supply network risks and resiliency – SCADA and ICS should be prioritized. Work on SCADA should take into consideration DOE's 21 Steps to Improve Cyber Security of SCADA Networks[16];
- Simulating and testing strategies should be developed and piloted to manage cybersecurity updates and maintenance, to minimize their negative impacts on productivity and profitability; and
- Creating shared research facilities focused on supply chain network cyber vulnerabilities discovery, detection, disclosure, and mitigation – Proposed facilities can be physical or virtual, but should emphasize inclusion and accessibility for the widest range of participants possible.

[16] https://www.energy.gov/sites/prod/files/oeprod/DocumentsandMedia/21_Steps_-_SCADA.pdf

iii. Education and Workforce Development (EWD)

EWD is vital to address the shortage of cybersecurity practitioners and skills gap in the existing workforce. Both topic areas must focus on innovative methods for workforce training, certification, apprenticeship, student curriculums and other learning programs to address the skills and knowledge gap in deploying the new technologies developed under the Institute. EWD must be considered alongside the technical efforts and could address:

- Training in new technologies of cybersecurity for energy efficient manufacturing through certification, apprenticeship and lifelong learning programs;
- Curriculum development on best practices with new technologies for cybersecurity in energy efficient manufacturing;
- Curriculum development emphasizing design for secure manufacturing and supply chain network; and
- New learning programs and accessible learning facilities on secure and efficient manufacturing.

iv. Development of a Roadmap

The applicant will identify R&D, modeling, and analysis activities which will be further informed by the Institute's roadmapping activities that will be undertaken during the Institute's first year, to identify and prioritize the highest impact areas from early-stage to applied R&D for a range of technology options. Applicants must include their vision for the development of a Roadmap including how the applicant has the subject matter expertise, resources, and facility capabilities to address the technical challenges and opportunities in the two topic areas.

As an outcome of roadmapping, the Institute will identify specific R&D, modeling and analysis activities and technical targets that align with the Roadmap priorities that would be negotiated with DOE into Budget Periods 2-5. The Institute will develop a consistent process to compete and select projects (e.g., Request for Proposal (RFP) process). Note, the projects selected under that process are subject to DOE approval and the process must reflect that requirement.

Note, the Institute's scope and budget are subject to change after each budget period based on year-to-year progress of the Institute's activities and project portfolio as well as ongoing alignment of the Institute's capabilities and expertise to the Roadmap priorities. See Section VI.B.xx Go/No-Go Review for more information.

v. Governance Structure and Membership Agreement

The recipient must work closely with its members and DOE to establish and operate a coordinated Institute. The Institute must have a clearly defined governance structure and a written set of Institute policies. The governance documents should

identify any boards, committees, or groups that comprise the Institute, and describe how they will be structured and operate, including the applicable voting rights. As part of the Technical Volume (see Section IV.D.ii), the applicant must describe its proposed governance structure. If selected for award, the governing documents (e.g., bylaws) and Institute policies must be in place before an award is issued.

Each member of the Institute must enter into a membership agreement that sets forth the terms and conditions of the membership, and by which the members agree to be subject to the governance structure and the Institute policies. As part of the Full Application, each applicant must submit a draft membership agreement (see Section IV.D.xix)(also see Appendix D for more information on the elements of a membership agreement). If selected for award, the membership agreement must be final before an award is issued.

vi. Expected Institute Activities

All work under EERE funding agreements must be performed in the United States. See Section IV.J.iii and Appendix B.

At a minimum, the applicant is expected to propose work to address the primary focus of the Institute within the topic areas, including EWD, identified in the FOA in Sections I.B.i, I.B.ii, and I.B.iii. Applicants may propose to address additional application areas and other cybersecurity issues in manufacturing but must justify the benefit of this additional work along a pathway towards achieving the goals of this FOA. The applicant must identify clear milestones and how the Institute will demonstrate progress towards the defined targets for the award project period at regular intervals and show a path to achieve the long term goals identified post award project period. All milestones and targets must be supported by credible analysis that is updated throughout the award. For any and all proposed application areas, it is strongly encouraged to have end users/OEMs from the relevant industries included in the Institute, demonstrating market pull and technical relevance for subsequent technology transfer and commercial adoption.

The Institute leadership team must be primarily focused on the operation and management of the proposed Institute. The Institute Chief Executive Officer must be a full time position and other key personnel (e.g., Chief Financial Officer, Chief Technology Officer, and Chief Operating Officer) are expected to provide at least a 75% time commitment to the Institute, with a 100% time commitment recommended during the Budget Period 1 start-up phase.

vii. Required Actions Prior to Award

Before DOE can issue an award under this FOA, the following documents related to the Institute's governance and management must be completed. Note, the

documents are subject to DOE review and approval. Because the activities listed below are required prior to the issuance of an award and are not part of the activities performed under the award, the costs associated with these activities are not allowable for reimbursement (or allowable as cost share).

The following agreements, plans, and procedures must be completed and in place prior to DOE issuing an award:

- U.S. Manufacturing Plan updated from original application submission if required. See Section IV.D.xiv for more information;
- Data Management Plan updated from original application submission if required. See Section IV.D.xvi for more information;
- Updated conflict of interest (COI) disclosure statement as per Section IV.D.xvii (due no later than seven (7) business days after notice of selection for award negotiations);
- Institute COI Plan that defines a consistent approach to identifying and mitigating COIs across the Institute. See Appendix C – Key Elements of a COI Plan and Section VI.B.xii for more information;
- Governance documents (e.g., bylaws);
- Membership Agreement;
- Cybersecurity Plan updated from original application submission. See Section IV.D.xviii for more information;
- Foreign Entity Participation Plan See Section VI.B.xv for more information;
- IP Management Plan updated from original application submission. See Section IV.D.xv and VI.B.x for more information;
- Non disclosure agreement that the Institute members must all agree to;
- Export Control Management Plan for the Institute;
- Conference Management Directive. See Appendix F, section E; and
- Operations Plan to include project management plan, risk management plan, and project selection plan.

viii. Expected Institute Activities During Budget Period 1

Budget Period 1 is expected to be 12 months in duration. During Budget Period 1, the Institute will develop a Roadmap and initiate startup activities with DOE as follows:

- Work closely with DOE to create and develop a Roadmap with prioritized R&D activities;
- Develop technology and project-level baselines, performance metrics, and technical targets, to define and achieve goals that will be used across the Institute;
- Develop and execute a competitive Request for Proposals (RFP) process to solicit and add new projects that support the Roadmap priorities;
- Map specific projects into the Roadmap;

- Develop an execution plan for activities to support CVDs in the manufacturing sector;
- Identify approaches that integrate across Roadmap areas and develop a plan for implementation across the Institute; and
- Develop a continuation package with DOE for incorporating specific projects' scopes of work and budgets into the award for Budget Period 2.

ix. Expected Institute Activities During Budget Periods 2-5

During Budget Periods 2-5, the Institute will work in a collaborative manner on R&D priorities defined by the Roadmap and provide progress updates. The Institute will provide data to update the Roadmap, based on the outcomes of its activities. The Institute will provide a detailed outline and budget estimate for the R&D, modeling, and/or analysis activities for the remainder of the project period (Budget Periods 2-5). Note, the Institute's scope and budget are subject to change after each budget period based on year-to-year progress of the activities and project portfolio as well as ongoing alignment of the capabilities and expertise to the Roadmap priorities.

The Roadmap and all supporting analysis conducted must track technological progress and inform how the Institute is performing against the technical baseline. The Roadmap must track technological progress to targets, and performance metrics identified in this FOA to achieve the outlined Institute goals. These baseline targets and metrics are expected to be further developed and refined during roadmapping activities. DOE will use this information to assess how the Institute should adjust R&D priorities. See Section VI.B.xx Go/No-Go Review for more information.

The DOE and Institute will work together to maintain a single Roadmap for the Institute as progress is made and various aspects evolve. The Institute must align and map R&D, modeling, and analysis activities and projects into the Roadmap.

C. Teaming Partner List

An effective application will include multi-disciplinary experts from industry, academia, state and local governments, NGOs, non-profits, national laboratories, and FFRDCs with expertise in cybersecurity applicable to the Institute that have the facilities and capabilities to address the broad set of challenges.

EERE is compiling a Teaming Partner List to facilitate the widest possible national participation in the formation of the Institute for this FOA. The list allows organizations who may wish to participate in an application, but do not wish to apply as the Prime applicant to the Institute, to express their interest to potential applicants and to explore potential partners.

The Teaming Partner List will be available on EERE Exchange at https://eere-exchange.energy.gov under FOA DE-FOA-0001960 during the time of its release through its closing. The Teaming Partner List will be updated at least weekly until the close of the Full Application period, to reflect new Teaming Partners who have provided their information. Any organization that would like to be included on this list should submit the following information to cemii@ee.doe.gov, with the subject line "Teaming Partner Information": Organization Name, Contact Name, Contact Address, Contact Email, Contact Phone, Organization Type, Area of Technical Expertise, and Brief Description of Capabilities.

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 this Teaming Partner List, EERE does not endorse or otherwise evaluate the qualifications of the entities that self-identify themselves for placement on the Teaming Partner List. EERE will not pay for the provision of any information, nor will it compensate any applicants or requesting organizations for the development of such information.

D. 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).
- Applications that are outside Technology Readiness Levels (TRL) 2 - 6. See Appendix G for more information.
- Applications that only propose a single R&D project. As an example – an application that only includes one R&D project under a single topic area to be conducted by a single Principal Investigator.

E. Authorizing Statutes

The programmatic authorizing statute is Section 911 (a)(2)(C) of the Energy Policy Act of 2005, as codified at 42 USC § 16191(a)(2)(C).

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

II. Award Information

A. Award Overview

i. Estimated Funding

EERE expects to make a total of approximately $70,000,000 of federal funding available for one new five year award under this FOA, subject to the availability of appropriated funds.

EERE will establish up to 5 budget periods for the award, however only funding for Budget Period 1 will be authorized initially. Budget Period 1 will have a duration of approximately 12 months of the overall project period.

The following activities must not be included in the Statement of Project Objectives (SOPO) or budget for Budget Period 1: Any costs associated with the formation of an entity to become the prime recipient, including the entity's policies and procedures or with the formation of an accounting system. These activities must be completed before or during negotiations and must be in place prior to the Contracting Officer approving the award.

Applicants must propose a budget and SOPO to accomplish Budget Period 1 activities as discussed in Section IV.D, Content and Form of the Full Application. Applicants must include a high level summary for the following 12 month (approximate) budget period for proposed initial technical work (Budget Period 2) (subject to change based on roadmapping outcomes). In addition, the application must include an outline of the SOPO and budget for the remaining budget periods (Budget Periods 3-5). All budget periods will be 12 months (approximate) in length. Additional detail will be required in the proposed SOPO and budget submitted as part of the continuation application required 90 days prior to the end of each budget period.

A total of up to $14,000,000 in federal funds is anticipated to be available for the award for each budget period, however early budget periods, especially Budget Period 1, are anticipated to be funded at lower than $14,000,000 with funding allocations increasing as project activities increase. Funding for Budget Periods 2-5 is not guaranteed.

The Institute's continuation applications must include proposed R&D activities that align with the Roadmap priority areas. Proposed R&D activities that are not deemed high priority as a result of roadmapping would be re-scoped or removed.

ii. Period of Performance

EERE anticipates making one award that will run up to 60 months in length, comprised of multiple budget periods. Before the expiration of each budget period, EERE, in partnership with CESER, will perform a Project-Wide Go/No-Go decision review (See Section VI.B.xx). Federal funding beyond a Project-Wide 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) the recipient's technical progress compared to the Milestone Summary Table included in the award; (4) the recipient's submittal of required reports (see Section VI.B.xix); (5) the recipient's compliance with the terms and conditions of the award; (6) EERE's Project-Wide Go/No-Go decision; (7) the recipient's timely submission of a continuation application; and (8) written approval of the continuation application by the Contracting Officer.

At each Project-Wide Go/No-Go decision point, EERE, in partnership with CESER, will evaluate performance, schedule adherence, the extent milestone objectives were met, compliance with reporting requirements, strategic plan execution, alignment to the Roadmap, and overall coordination and contribution to the EERE program goals and objectives. As a result of this evaluation, DOE will make a determination to continue funding the project, recommend re-direction of work under the project, place a hold on Federal funding for the project, or discontinue funding the project.

iii. New Applications Only

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

B. EERE Funding Agreements

Through Cooperative Agreements and other similar agreements, EERE provides financial and other support to projects that have the potential to realize the FOA objectives. EERE does not use such agreements to acquire property or services for the direct benefit or use of the United States Government.

i. Cooperative Agreements

EERE generally uses Cooperative Agreements to provide financial and other support to prime recipients.

Through Cooperative Agreements, EERE 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.

EERE has substantial involvement in all projects funded via Cooperative Agreement and will partner with CESER on this Institute. See Section VI.B.ix of the FOA for more information on what substantial involvement may involve.

ii. Funding Agreements with FFRDCs

In most cases, FFRDCs are funded independently of the remainder of the Project Team. The FFRDC then executes an agreement with any non-FFRDC Project Team members to arrange work structure, project execution, and any other matters.

Regardless of these arrangements, the entity that applied as the prime recipient for the project will remain the prime recipient for the project.

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

The prime recipient, subrecipients, and Institute members must be domestic entities, U.S. citizens or lawful U.S. permanent residents.

i. Individuals

U.S. citizens and lawful U.S. permanent residents are eligible to apply for funding as a prime recipient or subrecipient.

ii. Domestic Entities

Domestic for-profit entities, educational institutions, and nonprofits are eligible to apply for funding as a prime recipient or subrecipient. To qualify as a domestic entity, the applicant must be incorporated (or otherwise formed) under the laws of a particular State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States.

U.S. State, local, and tribal government entities are eligible to apply for funding as a prime recipient or subrecipient.

DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) are eligible to apply for funding as a prime recipient or subrecipient.

Domestic non-DOE/NNSA FFRDCs are eligible for funding as a subrecipient, but are not eligible to apply as a prime recipient.

Federal agencies and instrumentalities thereof (other than DOE) may be eligible for funding as a subrecipient, but are not eligible to apply as a prime recipient.

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

If a foreign entity applies for funding as a prime recipient, it must designate in the Full Application a domestic subsidiary or affiliate to be the prime recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

Foreign entities may request a waiver of the requirement to designate a domestic subsidiary or affiliate as the prime recipient in the Full Application (i.e., a foreign entity may request that it remains the prime recipient on an award). To do so, the applicant must submit an explicit written waiver request in the Full Application. Likewise, if the applicant seeks to include a foreign entity as a subrecipient or Institute member, the applicant must submit a separate explicit written waiver request in the Full Application for each proposed foreign subrecipient or Institute member.

Appendix B lists the necessary information that must be included in a Foreign Entity Participation waiver request. The applicant does not have the right to appeal EERE's decision concerning a waiver request.

iv. Incorporated Consortia

Domestic incorporated consortia are eligible to apply for funding as a prime recipient or subrecipient. Please refer to "Domestic Entities" above. For a foreign incorporated consortium, please refer to the requirements in "Foreign Entities" above.

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

If the incorporated consortium includes foreign members, the applicant must submit a separate explicit written waiver request in the Full Application for each foreign member. Appendix B.1 lists the necessary information that must be included in a waiver request. Also, please refer to Section VI.B.xv regarding involvement by foreign entities, including members of a consortium.

v. Unincorporated Consortia

An unincorporated consortium must designate one member of the consortium to serve as the prime recipient/consortium representative. The prime recipient/consortium representative must qualify as a domestic entity. If the consortium includes foreign members, the applicant must submit a separate explicit written waiver request in the Full Application for each foreign member. Appendix B.1 lists the necessary information that must be included in a waiver request. Also, please refer to Section VI.B.xv regarding involvement by foreign entities, including members of a consortium.

Upon request, an unincorporated consortium must provide the EERE 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 discuss, among other things, the consortium's:

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

B. Cost Sharing

The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-federal sources unless otherwise allowed by law. (See 2 CFR 200.306 and 2 CFR 910.130 for the applicable cost sharing requirements.)

PLEASE NOTE: Section 108, "Short-Term Cost-Share Pilot Program" of the recently enacted Department of Energy Research and Innovation Act (RIA), Pub. L. 115-246 removes the minimum statutory cost share requirement for Institutions of Higher Education and Non-Profit Organizations for research and development for a two year pilot period. Nevertheless, RIA does not automatically change the cost share requirements as set forth in 2 CFR 910.130 of DOE's financial assistance regulation without first amending the regulation. Therefore, until the regulation is updated and aligned with RIA or a cost share waiver is issued, DOE programs and Contracting Officers must adhere to the cost share requirements as set forth in 2 CFR 910.130 and the FOA.

To assist applicants in calculating proper cost share amounts, EERE has included a cost share information sheet and sample cost share calculation as Appendix A 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 Institute team other than the prime recipient, the prime recipient is legally responsible for paying the entire cost share. The prime recipient's cost share obligation is expressed in the Assistance Agreement as a static amount in U.S. dollars (cost share amount) and as a percentage of the Total Project Cost (cost share percentage). If the funding agreement is terminated prior to the end of the project period, the prime recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The prime recipient is solely responsible for managing cost share contributions by the Institute and enforcing cost share obligation assumed by Institute 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.J.i of the FOA. In addition, cost share must be verifiable if an applicant is selected for award negotiations. Verifiable cost share upon submission of the Full application is encouraged, but not required.

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.

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.

Program income, including membership fees, earned during the period of performance may not be used to meet recipient cost share. Program income must be subject to the Addition method as described in 2 CFR 200.307(e)(2). Program Income should not be included as cost share in the applicant's proposed budget.

Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 for additional guidance on cost sharing.

iv. Cost Share Contributions by FFRDCs

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

v. Cost Share Verification

Applicants are encouraged 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, including cost share commitment letters. Please refer to Appendix A of the FOA.

vi. Cost Share Payment

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

In limited circumstances, and where it is in the government's interest, the EERE 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

Concept Papers, Full Applications and Replies to Reviewer Comments must meet all compliance criteria listed below or they will be considered noncompliant. EERE will not review or consider noncompliant submissions, including Concept Papers, Full Applications, and Replies to Reviewer Comments that were: submitted through means other than EERE Exchange; submitted after the applicable deadline; and/or submitted incomplete. EERE will not extend the submission deadline for applicants that fail to submit required information due to server/connection congestion.

i. Compliance Criteria

1. Concept Papers

Concept Papers are deemed compliant if:

- The Concept Paper 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 EERE Exchange by the deadline stated in this FOA.

2. Full Applications

Full Applications are deemed compliant if:

- The applicant submitted a compliant Concept Paper;
- The Full Application complies with the content and form requirements in Section IV.D of the FOA; and
- The applicant successfully uploaded all required documents and clicked the "Submit" button in EERE Exchange by the deadline stated in the FOA.

3. Replies to Reviewer Comments

Replies to Reviewer Comments are deemed compliant if:

- The Reply to Reviewer Comments complies with the content and form requirements in Section IV.E of the FOA; and
- The applicant successfully uploaded all required documents to EERE Exchange by the deadline stated in the FOA.

D. Responsiveness Criteria

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

E. Other Eligibility Requirements

i. Requirements for DOE/National Nuclear Security Agency (NNSA) Federally Funded Research and Development Centers (FFRDCs) listed as the prime recipient

A DOE/NNSA FFRDC is eligible to apply for funding under this FOA if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application. If a DOE/NNSA FFRDC is selected for award negotiation, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract.

In addition to obtaining authorization from the cognizant Contracting Officer, Office of Science Laboratories are required to provide written authorization from the Director of Laboratory Policy (SC-32) with the application in order to be eligible to apply for funding under this FOA.

The following wording is acceptable for the authorization:

> Authorization is granted for the [Enter Laboratory Name] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, and will not adversely impact execution of the DOE assigned programs at the laboratory.

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

ii. Requirements for DOE/NNSA and non-DOE/NNSA Federally Funded Research and Development Centers 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:

1. **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.

2. **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.

   In addition to obtaining authorization from the cognizant Contracting Officer, Office of Science Laboratories are required to provide written authorization from the Director of Laboratory Policy (SC-32) with the application.

   The following wording is acceptable for this authorization:

   > Authorization is granted for the [Enter Laboratory Name] 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.

3. **Value/Funding**
   The value of and funding for the FFRDC portion of the work will not normally be included in the award to a successful applicant. Usually, DOE will fund a DOE/NNSA FFRDC contractor through the DOE field work proposal system and non-DOE/NNSA FFRDC through an interagency agreement with the sponsoring agency.

4. **Cost Share**
   Although the FFRDC portion of the work is usually excluded from the award to a successful applicant, the applicant's cost share requirement will be based on the total cost of the project, including the applicant's, the subrecipient's and the FFRDC's portions of the project.

5. **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 contractor.

6. **Limit on FFRDC Effort**
   The scope of work to be performed by the FFRDC may not be more significant than the scope of work to be performed by the applicant.

F. Limitation on Number of Concept Papers and Full Applications Eligible for Review

An entity may only submit one Concept Paper and one Full Application for consideration under this FOA. For example, EERE will only consider one Concept Paper and one Full Application per university for this FOA (not one submission per each college or school under the university). If an entity submits more than one Concept Paper and Full Application, EERE will request a determination from the applicant's authorizing representative as to which application should be reviewed. Any other submissions received listing the same entity as the applicant will not be eligible for further consideration. This limitation does not prohibit an applicant from collaborating on other applications (e.g., as a potential subrecipient or partner) so long as the entity is only listed as the applicant on one Concept Paper and Full Application submitted under this FOA.

G. Questions Regarding Eligibility

EERE 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.

IV. Application and Submission Information

A. Application Process

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

A **Control Number** will be issued when an applicant begins the EERE Exchange application process. This control number must be included with all application documents, as described below.

The Concept Paper, Full Application, and Reply to Reviewer Comments 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 Times New Roman 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.
- The Control Number must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.
- Each submission must not exceed the specified maximum page limit, including cover page, charts, graphs, maps, and photographs when printed using the formatting requirements set forth above and single spaced. If applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages.

Applicants are responsible for meeting each submission deadline. **Applicants are strongly encouraged to submit their Concept Papers and 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 Letter of Intent, Concept Paper, Full Application, or Reply to Reviewer Comments. Once the Concept Paper, Full Application, or Reply to Reviewer Comments is submitted in EERE Exchange, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit the Concept Paper, Full Application, or Reply to Reviewer Comments before the applicable deadline.

EERE urges applicants to carefully review their Concept Papers, and Full Applications and to allow sufficient time for the submission of required information and documents. All Full Applications that pass the initial eligibility review will undergo comprehensive technical merit review according to the criteria identified in Section V.A.ii of the FOA.

i. Additional Information on EERE Exchange

EERE Exchange is designed to enforce the deadlines specified in this FOA. The "Apply" and "Submit" buttons will automatically disable at the defined submission deadlines. Should applicants experience problems with EERE Exchange, the following information may be helpful.

Applicants that experience issues with submission PRIOR to the FOA deadline: In the event that an applicant experiences technical difficulties with a submission, the applicant should contact the EERE Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The EERE Exchange helpdesk and/or the EERE Exchange system administrators will assist applicants in resolving issues.

Applicants that experience issue with submissions that result in late submissions: In the event that an applicant experiences technical difficulties so severe that they are unable to submit their application by the deadline, the applicant should contact the EERE Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The EERE Exchange helpdesk and/or the EERE Exchange system administrators will assist the applicant in resolving all issues (including finalizing submission on behalf of and with the applicant's concurrence).

PLEASE NOTE, however, those applicants who are unable to submit their application on time due to their waiting until the last minute when network

traffic is at its heaviest to submit their materials will not be able to use this process.

B. Application Forms

The application forms and instructions are available on EERE Exchange. To access these materials, go to https://eere-Exchange.energy.gov and select the appropriate funding opportunity number.

Note: The maximum file size that can be uploaded to the EERE Exchange website is 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:
ControlNumber_LeadOrganization_Project_Part_1
ControlNumber_LeadOrganization_Project_Part_2

C. Content and Form of the Concept Paper

To be eligible to submit a Full Application, applicants must submit a Concept Paper by the specified due date and time.

i. Concept Paper Content Requirements

EERE will not review or consider ineligible Concept Papers (see Section III of the FOA).

Each Concept Paper must be limited to a single Institute concept. Unrelated concepts and technologies should not be consolidated into a single Concept Paper.

The Concept Paper must conform to the following content requirements:

Section	Page Limit	Description
Cover Page	1 page maximum	The cover page should include the proposed Institute title, both the technical (Institute Director/Executive) and business points of contact, names of all team member organizations, proposed budget, and any statements regarding confidentiality.

Technical Description, Innovation and Impact	6 pages maximum	Applicants are required to describe succinctly: • The proposed integrated technology approach for the Institute, including technical topic areas and core competencies; • The proposed technologies' target levels of performance (applicants should provide technical data or other support to show how the proposed target could be met); • A summary of the current state-of-the-art in the relevant field and applications, including key shortcomings, limitations, and challenges; • How the proposed key technology developments will overcome the shortcomings, limitations, and challenges in the relevant field and application; • The estimated impact on energy, competitiveness and cybersecurity that the proposed Institute would have in manufacturing; • The technical education and workforce development plan summary highlighting key aspects; and • The strategy to meet the goal of strengthening U.S. manufacturing competitiveness while engaging a wide range of stakeholders with both horizontal and vertical reach across and within supply chain networks.
Qualifications and Resources Description	5 pages maximum	Applicants are required to describe succinctly: • The key leadership and technical roles and responsibilities, and any individuals identified for these roles; • The skills, expertise and prior relevant experience of the Principal Investigator (Institute Director/Executive) and Project Team that demonstrates capability to successfully execute the Institute; and • The proposed Institute's access to equipment and facilities necessary to accomplish the effort and/or a clear explanation of how the Institute intends to obtain access to the necessary equipment and facilities.
Operations and Management Approach Description	3 pages maximum	Applicants are required to describe succinctly: • The proposed management and operations structure and approach, including the role of the U.S. government in the management of the proposed Institute.
Addendum	4 pages maximum	Applicants may provide graphs, charts, or other data to supplement their Technical Description.

EERE makes an independent assessment of each Concept Paper based on the criteria in Section V.A.i of the FOA. EERE will encourage a subset of applicants to

submit Full Applications. Other applicants will be discouraged from submitting a Full Application. An applicant who receives a "discouraged" notification may still submit a Full Application. EERE will review all eligible Full Applications. However, by discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project in an effort to save the applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

EERE may include general comments provided from reviewers on an applicant's Concept Paper in the encourage/discourage notification posted on EERE Exchange at the close of that phase.

D. 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 application forms found on the EERE Exchange website at https://eere-Exchange.energy.gov/, in accordance with the instructions.

Applicants will have approximately 60 days from receipt of the Concept Paper Encourage/Discourage notification on EERE Exchange to prepare and submit a Full Application. Regardless of the date the applicant receives the Encourage/Discourage notification, the submission deadline for the Full Application remains the date and time stated on the FOA cover page.

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

i. Full Application Content Requirements

EERE will not review or consider ineligible Full Applications (see Section III of the FOA).

Each Full Application shall be limited to a single concept or technology. Unrelated concepts and technologies shall not be consolidated in a single Full Application. Full Applications must conform to the following requirements:

Submission	Components	File Name
Full Application	Technical Volume (See Chart in Section IV.D.ii) (100 page limit)	ControlNumber_LeadOrganization_TechnicalVolume

(PDF, unless stated otherwise)	Statement of Project Objectives (Microsoft Word format) (40 page limit)	ControlNumber_LeadOrganization_SOPO
	SF-424 Application for Federal Assistance (PDF format)	ControlNumber_LeadOrganization_App424
	Budget Justification (Microsoft Excel format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_Budget_Justification
	Summary for Public Release (PDF format) (2 page limit)	ControlNumber_LeadOrganization_Summary
	Summary Slides (4 slide limit, Microsoft PowerPoint format)	ControlNumber_LeadOrganization_Slide
	Subrecipient Budget Justification, if applicable (Microsoft Excel format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_Subrecipient_Budget_Justification
	DOE Work Proposal for FFRDC, if applicable (see DOE O 412.1A, Attachment 3) (PDF format)	ControlNumber_LeadOrganization_WP
	Authorization from cognizant Contracting Officer for FFRDC, if applicable (PDF format)	ControlNumber_LeadOrganization_FFRDCAuth
	Authorization from Director of Laboratory Policy (SC-32), if applicable (PDF format)	ControlNumber_LeadOrganization_SC-32Auth
	SF-LLL Disclosure of Lobbying Activities (PDF format)	ControlNumber_LeadOrganization_SF-LLL
	Foreign Entity and Foreign Work waiver requests, if applicable (PDF format)	ControlNumber_LeadOrganization_Waiver
	U.S. Manufacturing Plan (PDF format)	ControlNumber_LeadOrganization_USMP
	Draft IP Management Plan (PDF format)	ControlNumber_LeadOrganization_IPP
	Data Management Plan (PDF format)	ControlNumber_LeadOrganization_DMP
	Conflict of Interest Disclosure Statement (PDF format)	ControlNumber_LeadOrganization_COI
	Draft Membership Agreement (PDF format)	ControlNumber_LeadOrganization_Membership_Agreement
	Draft Cybersecurity Plan (PDF format)	ControlNumber_LeadOrganization_Cybersecurity_Plan
	Compliance Matrix (PDF format)	ControlNumber_LeadOrganization_Matrix

Note: The maximum file size that can be uploaded to the EERE Exchange 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:

ControlNumber_LeadOrganization_TechnicalVolume_Part_1
ControlNumber_LeadOrganization_TechnicalVolume_Part_2

EERE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 10MB.

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

ii. Technical Volume

The Technical Volume must be submitted in Adobe PDF format. The Technical Volume must conform to the following content and form requirements, including maximum page lengths. If applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages. This volume must address the Merit Review Criteria as discussed in Section V.A.ii of the FOA. Save the Technical Volume in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_TechnicalVolume".

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

The Technical Volume to the Full Application may not be more than **100 pages**, 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 evaluation criteria (see Section V.A.ii of the FOA) when preparing the Technical Volume.

SECTION/PAGE LIMIT	DESCRIPTION
Cover Page	The cover page should include the Institute title, both the technical (Institute Director/Executive) and business points of contact, names of all team member organizations, and any statements regarding confidentiality.

Institute Overview (This section should be no more than 2 pages)	The Institute Overview should contain the following information: • Institute Goals: The applicant should explicitly identify the targeted improvements to the baseline technology and the critical success factors in achieving that goal; • Overview of Institute technical structure or "architecture" with a graphical representation; • Summary of the key technical work or approaches in bulleted format; and • Total funding requested, including federal and cost share.
Technical Description, Innovation, and Impact (This section should constitute approximately 50% of the Technical Volume)	The Technical Description should describe the overall structure or "architecture" of the Institute, including technical topic areas and core competencies, the technical challenges specific to those topic areas and proposed innovative solutions to those challenges that will be explored in the specific projects and work that are defined in greater detail in the Statement of Project Objectives (SOPO). This section should emphasize how the proposed R&D activities, innovations, and approach will enable achievement of the overall Institute goals and describe the impact of the Institute. Specifically describe: • Technology Development: The integrated technical approach, the overall structure or "architecture" and the core competencies of the proposed Institute as they align with and build upon the technical topic areas identified in the FOA; • Relevance: The key barriers and opportunities in the technical topic areas proposed to advance the field of cybersecurity in energy efficient manufacturing; • Targets: The proposed performance metrics for the Institute as a whole and quantitative technical goals for the *Institute for Cybersecurity in Energy Efficient Manufacturing.* Applicants must show how the proposed targets are projected to increase energy efficiency, productivity and cybersecurity for individual manufacturing operations or sectors as a whole; • Innovations: For the identified technical topic areas, the specific technical innovations that the Institute will pursue and demonstration of scientific merit and feasibility of these proposed ideas to achieve the goals identified; • Vulnerability Awareness: The proposed approach the Institute will take to fostering improved and increased discovery, detection, and disclosure of cybersecurity vulnerabilities related to the specific technical innovations that the Institute will pursue. The approach must include the CVD activities described in the FOA in Sections I.A. and I.B.; • Technical Education and Workforce Development: The technical education and workforce development plan, how technical data and information will be shared among members and the broader manufacturing community, and how the educational/workforce activities are integrated into the other aspects of the Institute;

	• Roadmap: The applicant should describe its vision for how the Institute will develop a comprehensive Roadmap to identify the technical and non-technical challenges across the topic areas of the Institute. This will require the Institute to prioritize R&D, based on metrics outlined in this FOA;
	• Impacts: The estimated impact that the proposed Institute would have on cybersecurity in manufacturing and supply chain networks with a focus on energy efficiency and productivity. Applicants must provide realistic estimates for the projected Institute impact on cybersecurity in energy efficient manufacturing operations and supply chain networks over ten years relative to existing available technologies. Applicants must provide justification for all estimates and assumptions;
	• U.S. Manufacturing Plan: Strategy to meet the goal of strengthening U.S. manufacturing competitiveness while engaging a wide range of stakeholders that may include foreign participants. Summarize the U.S. Manufacturing Plan (to be submitted as a separate document) describing the level of commitment to support U.S. manufacturing competitiveness;
	• Market Transformation Plan: The applicant should provide a market transformation plan, including the following:
	  ○ Identification of target market, competitors, and distribution channels for proposed technologies 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, U.S. manufacturing plan, and product distribution;
	• 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; and
	• A detailed Statement of Project Objectives (SOPO) for the first two budget periods (12 month Budget Period 1 and a subsequent 12 month budget period (Budget Period 2)) as well as an outline for subsequent budget periods is required. The SOPO is to be submitted with the application and will not count as part of the technical volume page count.

Qualifications and Resources (Approximately 20% of the Technical Volume)	The Qualifications and Resources section should contain the following information: • Qualifications: The Institute Team's unique qualifications and expertise of the lead organization including those of key subrecipients to execute the proposed Institute; • Leadership: The key leadership and technical roles and responsibilities, the skills, expertise and prior relevant experience of the individuals identified for these roles and the level of time commitment of each individual to the Institute. **Note: Attach one-**

	page resumes for key participating team members as an appendix. Resumes do not count towards the page limit. Multi-page resumes are not allowed; • Facilities: The Institute Team's equipment and facilities necessary accomplish the scope of work; include a justification of updates to or any new equipment or facilities requested as part of the initial work of the Institute or how the Institute will access necessary equipment and facilities; • Leveraged Resources: Illustrate the specific ways in which DOE funding will enable acceleration of R&D (e.g., complement existing physical infrastructure, human capital, intellectual property, or other resources) and thereby lead to outcomes that are more impactful than these resources would be in isolation. Describe how the Institute will utilize and leverage technical services to be provided by DOE/NNSA FFRDCs, National Institute of Standards and Technology's Manufacturing Extension Partnership (MEP), National Science Foundation's Advanced Technological Education (ATE) Centers, national laboratories, and other government investments, if applicable; • Support: Attach any letters of support or cost share commitment letters from partners/end users as an appendix (1 page maximum per letter). Cost share commitment letters are encouraged, but not required with the Full Application. Letters of support and cost share commitment letters do not count towards the page limit; Cost Share Summary: The prime recipient is responsible for overall cost share. The applicant must summarize the proposed cost share in a table in the Technical Volume, clearly defining cost share contributions (cash or in-kind) with a total calculation for each type of cost share. The cost share summary must also include a breakdown of the source of the funding showing total percent contribution by industry, academia, state and local governments, NGOs, and non-profits to the cost share total. Cost share commitment letters will be required prior to making an award; • Budget Summary: Provide an overall budget summary that supports the proposed project and objectives, and can accommodate changes in strategic direction that may occur once the Institute is formalized and aligned with strategic roadmaps. Additionally, any funds anticipated from other non-cost share sources such as fee-for-service work at full cost burden, IP licenses, membership dues should be identified and included in the budget under program income; and • Organizational Resources: Describe the applicant organization's administrative and financial experience, resources and capabilities to support execution of complex federally-funded research efforts: include a list of the applicant's current/previous efforts of similar scope and magnitude to an Institute. Include an explanation of how the organization will execute, manage, provide oversight on, and reimburse multiple subcontracts in a

	timely manner, and highlight currently existing policies and procedures for standard operations, HR and accounting/finance/contracting abilities available to support Institute activities.
Operations and Management Approach (Approximately 30% of the Technical Volume)	The Operations and Management Approach should contain a description of the following, expanding on the content from the Concept Paper: Operations and Management • The overall management approach including the roles and the work to be performed by the applicant, each PI and Key Participants; • A proposed organizational chart, to including management structure, Institute Director/Executive, key management staff as well as technical advisory and strategic governance boards; • The proposed governance structure, and an explanation of how decisions will be made and how any governing entities/advisory boards will function and what authority they will have and how the Federal Government (DOE and others as identified by DOE) will be included in strategic and technical decision making; • How the proposed Institute will operate as an independent, neutral and non-biased entity to coordinate and convene a broad range of stakeholders; • The proposed participation structure (e.g., tiered membership structure, pay-for-use arrangements, and other aspects) and the benefits and restrictions for each level of participation including IP rights; • A summary of the business agreements that will be utilized between the applicant and different participants; • The plan for coordination and communication with other Institutes as they are established, and external stakeholder dissemination of knowledge. The proposed Institute is expected to coordinate with, share and establish best practices, and participate in meetings with other Manufacturing Innovation Institutes established by DOE and other federal agencies; • The industry road-mapping process and mechanism for identification of technical and non-technical challenges appropriate to be addressed by the Institute, including quantified targets associated with roadmap goals as well as the plan to update the roadmap periodically (annual or bi-annual); • The annual strategic planning and project review/assessment process for the Institute. The process by which the industry roadmap will inform and establish priorities for the Institute strategic plan. How the annual planning process will encourage new ideas and participants in the Institute activities; • The process for making decisions on scientific/technical direction including how R&D projects and technical work in the proposed R&D facilities will be selected, prioritized, relate to road-mapping efforts, and how conflicts will be resolved; • The plan to encourage openness and new participants as the Institute goes forward including plans to fund expansion of R&D

	activities as the Institute evolves and the plan to keep the Institute relevant and accommodate the strategic changes that may occur to align with the industry roadmap and enable partnerships with other federal government agencies; • How the Institute will encourage participation by small and medium-sized enterprises (SMEs) (examples include providing free or low-cost access to the shared infrastructure, low barrier or no entry fees to membership, job swapping arrangements between Institute and SME staff, engagement of the Manufacturing Extension Partnership (MEP) Centers, among others); • Integration: How the Institute will operate as an integrated organization - how individual Institute elements (shared R&D facilities, initial R&D projects, stakeholder engagement and road-mapping efforts, technical education and workforce development and commercialization activities) will be connected to provide value that is greater than the sum of the individual activities (i.e., how will the shared facilities support the technical education and workforce development plans and project activities); • Performance Management: Describe how Institute performance will be tracked and evaluated; describe plans for program reviews, frequency and methodology for how they will be conducted; • Project Management: The applicant should discuss the team's proposed management plan for any initial proposed R&D projects or technical work in the R&D facilities described in the SOPO, including the following: ○ The overall approach to and organization for managing the individual work activities; ○ 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; ○ A description of how project changes will be handled; ○ If applicable, the approach to Quality Assurance/Control; and ○ How communications will be maintained among Project Team members; • Membership Agreement: An outline or draft of the agreement that documents the partnership between Institute members; • COI Procedures: An outline or draft of the COI procedures to identify and mitigate COIs across the Institute in agreement with DOE's procedures; • Cybersecurity Plan: An outline or draft of the approach and policies for cybersecurity for the Institute and its members. Foreign Entities: Describe how the Institute will handle participation of foreign entities and foreign individuals as users, members, subrecipients or otherwise engage in activities at the

	Institute or in connection with the Institute while ensuring the goal to strengthen U.S. manufacturing competitiveness is met;
	• Export Control: How the Institute will manage export control compliance for activities at the Institute or in connection with the Institute;
	• Risk Mitigation: A risk assessment and risk mitigation plan for the technical, economic, and operational aspects of the proposed Institute including Intellectual Property management and strengthening U.S. manufacturing competitiveness; and
	• IP Management: A detailed summary of the major points in the draft IP Management Plan submitted as an appendix. The summary should include, as appropriate for any different plans for how IP is to be handled:
	  ○ Ownership;
	  ○ Dissemination pathways for IP, eligibility for licensing;
	  ○ IP sharing for research purposes;
	  ○ IP sharing for educational purposes;
	  ○ How the IP management plan will support domestic manufacturing and encourage participation by domestic industry in the Institute; and
	  ○ How IP issues inherent with collaborations and/or multi-user facilities will be addressed.
	Financial Sustainability
	• Describe the sustainability plan for the proposed Institute past the award project period, including realistic strategies to increase revenue in later years of the award project period in order to achieve financial self-sufficiency within five years from dedicated Institute funding;
	• Describe the proposed sources of funding/revenue and the model which will support the Institute operations beyond the award project period;
	• Provide an estimate of profit and loss for three years after the initial five year award project period demonstrating how the Institute will maintain financial self-sufficiency; and
	• Explain the strategy to keep the Institute relevant to industry, what resources will support Institute operations beyond the award project period and how manufacturing professionals will be recruited and trained over time to support the Institute.

iii. Statement of Project Objectives

Applicants are required to complete a Statement of Project Objectives (SOPO). A SOPO template is available on EERE Exchange at https://eere-Exchange.energy.gov/. The SOPO, including the Milestone Table, must not exceed 40 pages when printed using standard 8.5 x 11 paper with 1" margins (top, bottom, left, and right) with font not smaller than 12 point. Save the SOPO in a single Microsoft Word file using the following convention for the title "ControlNumber_LeadOrganization_SOPO".

Applicants should propose a SOPO to accomplish Budget Period 1 activities as discussed in Section I.B. Within the page limit, applicants should also include a high level summary for the following 12 month (approximate) budget period for proposed initial technical work (Budget Period 2) (subject to change based on roadmapping outcomes). In addition, the application should include an outline of the SOPO and budget for the remaining budget periods (Budget Periods 3-5). Detail will be required in the proposed SOPO submitted as part of the continuation application required 90 days prior to before the end of each budget period.

iv. SF-424: Application for Federal Assistance

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 http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms, under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period and not just the first project year, first phase or other subset of the project period. Save the SF-424 in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_App424".

v. Budget Justification Workbook (EERE 335)

- Applicants are required to complete the Budget Justification Workbook. This form is available on EERE Exchange at https://eere-Exchange.energy.gov/.
- Prime recipient must complete each tab of the Budget Justification Workbook for the project as a whole, including all work to be performed by the rime recipient and its subrecipients and contractors.
- Applicants should include costs associated 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 "ControlNumber_LeadOrganization_Budget_Justification".

Due to the nature of this FOA, the budgets submitted with the application are subject to change during negotiations. Award budgets and scopes will also be negotiated on an annual basis, based on updates to the Institute's Roadmap, the outcome of project performance evaluations such as Individual Institute Activity

Go/No-Go reviews, and the recommendations or outcomes of Institute peer reviews.

Subrecipient costs should be captured in the Contractual tab of the applicant's Budget Justification (EERE 335) for all budget periods, including high level estimates for Budget Periods 2-5. An EERE 335 is required for each subrecipient that is expected to perform work estimated to be more than $250,000 or 25 percent of the work effort (whichever is less) for Budget Period 1 costs only. The applicant is required to submit a complete EERE 335, which will include estimated costs for all 5 budget periods.

vi. Summary/Abstract for Public Release

Applicants are required to submit a two-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/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (e.g., benefits, outcomes), 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 2 pages when printed using standard 8.5 x 11 paper with 1" margins (top, bottom, left, and right) with font not smaller than 12 point. Save the Summary for Public Release in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_Summary".

vii. Summary Slides

Applicants are required to provide PowerPoint slides (up to four slides) summarizing the proposed project. The slides must be submitted in Microsoft PowerPoint format. The slides are used during the evaluation process. Save the Summary Slides in a single file using the following convention for the title "ControlNumber_LeadOrganization_Slides".

The Summary Slides 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;
- Project title, prime recipient, principal investigator, and key participant information; and
- Requested EERE funds and proposed applicant cost share.

viii. 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) for Budget Period 1 only. The budget justification must include the same justification information described in the "Budget Justification" section above. Save each subrecipient budget justification in a Microsoft Excel file using the following convention for the title "ControlNumber_LeadOrganization_Subrecipient_Budget_Justification".

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

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, the applicant must provide a DOE Work Proposal (WP) in accordance with the requirements in DOE Order 412.1A, Work Authorization System, Attachment 3, available at: https://www.directives.doe.gov/directives-documents/400-series/0412.1-BOrder-a-admchg1/@@images/file. Save the WP in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_WP".

x. Authorization for non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable)

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

xi. Authorization from Director of Laboratory Policy (SC-32), (if applicable)

In addition to obtaining authorization from the cognizant Contracting Officer, Office of Science Laboratories are required to provide written authorization from the Director of Laboratory Policy (SC-32) with the application. Save the Authorization in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_SC-32Auth".

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

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

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

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

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

xiii. Waiver Requests: Foreign Entities and Foreign Work (if applicable)

1. Foreign Entity Participation

As set forth in Section III.A.iii, the prime recipient, subrecipients, and Institute members under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or 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 B lists the necessary information that must be included in a request to waive this requirement.

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

As set forth in Section IV.J.iii, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the prime recipient should make every effort to purchase supplies and equipment within the United States. Appendix B lists the necessary information that must be included in a foreign work request.

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

xiv. U.S. Manufacturing Commitments

Pursuant to the Department of Energy Determination of Exceptional Circumstances dated September 9, 2013, each applicant is required to submit a U.S. Manufacturing Plan as part of its application. The U.S. Manufacturing Plan represents the applicant's measurable commitment to support U.S. manufacturing.

Each U.S. Manufacturing Plan must include a commitment that any products embodying any subject invention or produced through the use of any subject invention will be manufactured substantially in the United States, unless the applicant can show to the satisfaction of DOE that it is not commercially feasible to do so (referred to hereinafter as "the U.S. Competitiveness Provision"). The applicant further agrees to make the U.S. Competitiveness Provision binding on any sub-awardee and any assignee or licensee or any entity otherwise acquiring rights to any subject invention, including subsequent assignees or licensees. A subject invention is any invention conceived of or first actually reduced to practice under an award.

Due to the lower technology readiness levels of this FOA, DOE does not expect the U.S. Manufacturing Plans to be tied to a specific product or technology. However, in lieu of the U.S. Competitiveness Provision, an applicant may propose a U.S. Manufacturing Plan with more specific commitments that would be beneficial to the U.S. economy and competitiveness. For example, an applicant may commit specific products to be manufactured in the U.S., commit to a specific investment in a new or existing U.S. manufacturing facility, keep certain activities based in the U.S. or support a certain number of jobs in the U.S. related to the technology. An applicant which is likely to license the technology to others, especially universities for which licensing may be the exclusive means of commercialization the technology, the U.S. Manufacturing Plan may indicate the applicant's plan and commitment to use a specific licensing strategy that would likely support U.S. manufacturing.

If DOE, at its sole discretion, determines that the more specific commitments would provide a sufficient benefit to the U.S. economy and industrial competitiveness, the specific commitments will be part of the terms and conditions of the award. For all other awards, the U.S. Competitiveness Provision shall be incorporated as part of the terms and conditions of the award as the U.S. Manufacturing Plan for that award.

The U.S. Competitiveness Provision is also a requirement for the Class Patent Waiver that applies to domestic large business under this FOA (see Section VIII.L. Title to Subject Inventions).

Save the U.S. Manufacturing Plan in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_USMP".

xv. Draft IP Management Plan

As part of the application, applicants are required to submit a draft IP Management Plan that will form the basis of the final and executed IP

Management Plan as described in Section VI.B.x of this FOA. The draft is expected to cover the major points as described in Section VI.B.x of this FOA. The prime recipient must submit a completed and signed Intellectual Property Management plan to DOE prior to award. All Intellectual Property Management Plans are subject to the terms and conditions of the funding agreement and its intellectual property provisions, and applicable federal laws, regulations, and policies, all of which take precedence over the terms of Intellectual Property Management Plans.

Save the IP Management Plan in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_IPP".

xvi. Data Management Plan

Applicants are required to submit a Data Management Plan with their Full Application. An applicant may select one of the template Data Management Plans listed below. Alternatively, instead of selecting one of the template Data Management Plans below, an applicant may submit another Data Management Plan provided that the Data Management Plan, at a minimum, (1) describes how data sharing and preservation will enable validation of the results from the proposed work, how the results could be validated if data are not shared or preserved and (2) has a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publications. DOE Public Access Plan dated July 24, 2014 provides additional guidance and information on Data Management Plans.

Option 1: For the deliverables under the award, the recipient does not plan on making the underlying research data supporting the findings in the deliverables publicly-available for up to 5 years after the data were first produced because such data will be considered protected under the award. The results from the DOE deliverables can be validated by DOE who will have access, upon request, to the research data. Other than providing deliverables as specified in the Award, the recipient does not intend to publish the results from the project. However, in an instance where a publication includes results of the project, the underlying research data will be made available according to the policies of the publishing media. Where no such policy exists, the recipient must indicate on the publication a means for requesting and digitally obtaining the underlying research data. This includes the research data necessary to validate any results, conclusions, charts, figures, images in the publications.

Option 2: For any publication that includes results of the project, the underlying research data will be made available according to the policies of the publishing media. Where no such policy exists, the recipient must indicate on the publication a means for requesting and digitally obtaining the underlying

research data. This includes the research data necessary to validate any results, conclusions, charts, figures, images in the publications.

xvii. Conflict of Interest Disclosure Statement

Due to the high profile nature of this Institute and its impact on U.S. manufacturing, it is important that any conflicts of interest (COI), whether actual or perceived, affecting the key personnel for the Institute be identified and a mitigation plan be developed. Examples of conflicts of interest include, but are not limited to: financial holdings, business relationships, professional affiliations, and personal relationships and/or affiliations that currently exist or arise during the operation of the Institute involving foreign and domestic institutions and individuals. The disclosure statements must also identify any financial ties to foreign entities and any current or past work with foreign governments.

The applicant must provide a COI Disclosure Statement for all key Institute personnel. Identify potential, apparent, or actual organizational and individual conflicts of interest. Negative responses are also required.

Save the Conflict of Interest Disclosure Statement in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_COI".
If an applicant is selected for award negotiations, the applicant must submit an Updated COI Disclosure Statement. See Section VI.B.xi - Updated Conflict of Interest Disclosure Statement.

xviii. Draft Cybersecurity Plan

The applicant must provide a cybersecurity plan. The plan must address at a minimum:

- Procedures for documenting, protecting, and sharing of data collected and generated by the Institute on vulnerabilities and protection. This must include what entities and individuals are given access and how levels of access are determined;
- Security requirements or capabilities the institute would obtain/achieve regarding its data storage system;
- A description of roles and responsibilities of individuals and entities related to the activities of ensuring the cybersecurity of the institute itself.

xix. Draft Membership Agreement

Applicants must provide a "Membership Agreement". See Appendix D for information on the required content.

Save the Membership Agreement in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_Membership_Agreement".

xx. Compliance Matrix

Applicants must provide a "Compliance Matrix" in table format (separate and exempt from total page count) that explains how and where each merit review criterion is addressed in the Project Narrative and Application documentation. The table's format is at the discretion of the applicant.
Save the Compliance Matrix in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_Matrix".

E. Content and Form of Replies to Reviewer Comments

EERE will provide applicants with reviewer comments following evaluation of all eligible Full Applications. Applicants will have a brief opportunity to review the comments and to prepare a short Reply to Reviewer Comments responding to comments however they desire or supplementing their Full Application. The Reply to Reviewer Comments is an optional submission; applicants are not required to submit a Reply to Reviewer Comments. EERE will post the Reviewer Comments in EERE Exchange. The expected submission deadline is on the cover page of the FOA; however, it is the applicant's responsibility to monitor EERE Exchange in the event that the expected date changes. The deadline will not be extended for applicants who are unable to timely submit their reply due to failure to check EERE Exchange or relying on the expected date alone. Applicants should anticipate having approximately three (3) business days to submit Replies to Reviewer Comments.

EERE will not review or consider ineligible Replies to Reviewer Comments (see Section III of the FOA). EERE will review and consider each eligible Full Application, even if no Reply is submitted or if the Reply is found to be ineligible.

Replies to Reviewer Comments must conform to the following content and form requirements, including maximum page lengths, described below. If a Reply to Reviewer Comments is more than ten pages in length, EERE will review only the first ten (10) pages and disregard any additional pages.

SECTION	PAGE LIMIT	DESCRIPTION
Text	9 pages max	Applicants may respond to one or more reviewer comments or supplement their Full Application.
Optional	1 page max	Applicants may use this page however they wish; text, graphs, charts, or other data to respond to reviewer comments or supplement their Full Application are acceptable.

F. Post-Selection Information Requests

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

- 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;
- Environmental Questionnaire; and
- Accounting System Survey.

G. Dun and Bradstreet Universal Numbering System Number and System for Award Management

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 System for Award Management (SAM) at https://www.sam.gov before submitting its application; (2) provide a valid Dun and Bradstreet Universal Numbering System (DUNS) 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 DUNS 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 may 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.

H. Submission Dates and Times

Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted in EERE Exchange no later than 5 p.m. Eastern Time on the dates provided on the cover page of this FOA.

I. Intergovernmental Review

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

J. Funding Restrictions

i. Allowable Costs

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable federal cost principles.

Refer to the following applicable federal cost principles for more information:

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

ii. Pre-Award Costs

Selectees 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 Contracting Officer assigned to the award.

Pre-award costs cannot be incurred prior to the Selection Official signing the Selection Statement and Analysis. Pre-award costs can only be incurred if such costs would be reimbursable under the agreement if incurred after award.

Pre-Award expenditures are made at the Selectee's risk; EERE 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. **Pre-Award Costs Related to National Environmental Policy Act (NEPA) Requirements**

   EERE'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 EERE completing the NEPA review process.

   EERE does not guarantee or assume any obligation to reimburse costs where the prime recipient incurred the costs prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that 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 and such costs may not be recognized as allowable cost share. Likewise, if a project 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 EERE 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. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override these NEPA requirements 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.

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

1. Requirement

All work performed under EERE awards must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment; however, the prime recipient should make every effort to purchase supplies and equipment within 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, EERE 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 the award be performed outside the United States, absent a waiver, regardless of if the work is performed by the prime recipient, subrecipients, contractors or other project partners.

3. Waiver

There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a foreign work waiver, the applicant must submit a written waiver request to EERE. Appendix B lists the necessary information that must be included in a request for a foreign work waiver.

The applicant must demonstrate to the satisfaction of EERE that a waiver would further the purposes of the FOA and is in the economic interests of the United States. EERE may require additional information before considering a waiver request. Save the waiver request(s) in a single PDF file titled “ControlNumber_PerformanceofWork_Waiver”. The applicant does not have the right to appeal EERE’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. Funding from this FOA (including required cost share) is NOT permitted (or allowed) for construction of new buildings, for construction of new facilities for the Institute, or for major renovation of existing buildings.

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 USC 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

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

Property disposition will be required at the end of a project if the current fair market value of property exceeds $5,000. The rules for property disposition are set forth in 2 CFR 200.310 – 200.316 as amended by 2 CFR 910.360.

vii. Lobbying

The recipient 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 your 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.

viii. Risk Assessment

Prior to making a federal award, the DOE is required by 31 U.S.C. 3321 and 41 U.S.C. 2313 to review information available through any OMB-designated repositories of government-wide eligibility qualification or financial integrity information, such as SAM Exclusions and "Do Not Pay."

In addition, DOE evaluates the risk(s) posed by applicants before they receive federal awards. This evaluation may consider: results of the evaluation of the applicant's eligibility; the quality of the application; financial stability; quality of management systems and ability to meet the management standards prescribed in this part; history of performance; reports and findings from audits; and the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-federal entities.

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

ix. Invoice Review and Approval

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

- Summary of costs by cost categories;
- Timesheets or personnel hours report;
- 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/or
- Other items as required by DOE.

V. Application Review Information

A. Technical Review Criteria

i. Concept Papers

Concept Papers are evaluated based on consideration of the following factors. All sub-criteria are of equal weight.

Criterion 1: Technical Description, Innovation and Impact (50%)

This criterion involves consideration of the following factors:

- Quality of the proposed integrated cybersecurity in energy efficient manufacturing technical approach;
- The proposed topic areas are well-defined and have well-defined, aggressive quantitative technical objectives and metrics for success;
- The applicant's understanding of the current state-of-the-art in the field of cybersecurity in energy efficient manufacturing, including key opportunities and challenges;
- Extent to which the applicant has described how the proposed technical work will overcome the challenges identified;
- The estimated energy and competitiveness impact that the proposed Institute would have on cybersecurity and energy efficient manufacturing;
- Quality of the approach presented in the technical education and workforce development plan summary; and
- Quality of the approach to strengthen U.S. manufacturing competitiveness while engaging a broad range of stakeholders with both horizontal and vertical reach across and within supply chain networks.

Criterion 2: Team and Resources (25%)

This criterion involves consideration of the following factors:

- Extent to which the roles and responsibilities of the leadership team are well-defined;
- Whether the Principal Investigator (Institute Director/Executive) and Project Team have the skill, expertise and prior experience needed to successfully execute the Institute; and
- Whether the applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explains how the proposed Institute intends to obtain access to the necessary equipment and facilities.

Criterion 3: Operations and Management Approach Description (25%)

This criterion involves consideration of the following factor:

- The proposed management and operations structure and approach, including the role of the U.S. government in the management of the proposed Institute.

ii. Full Applications

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

Criterion 1: Technical Merit, Innovation and Impact (50%)

Technical Merit and Innovation

- Quality of the integrated technical approach, including core competencies identified for the proposed Institute to research, develop and demonstrate innovative cybersecurity for energy efficient manufacturing technologies that meet the goals and the objectives of the Institute in Section I.B. and those proposed by the applicant;
- Degree to which the applicant has defined and justified the proposed topic areas building upon those identified in Section I.B. of this FOA, and has clearly defined Institute objectives, goals, and performance metrics including aggressive technical targets to achieve the goals of the FOA;
- Extent to which the applicant demonstrates a strong understanding of the state of the art, and the sufficiency of technical detail in the application to assess whether the proposed technical work as described in the Technical Volume and the SOPO is scientifically meritorious, feasible and innovative, to achieve greater energy efficiency, technical targets, goals and objectives of the Institute; and
- Quality of the technical education and workforce development plan to integrate and support technical education and career training into the Institute ecosystem, and leverage existing resources.

Statement of Project Objectives

- Adequacy, appropriateness, and reasonableness of the proposed work and schedule overall and allocation among the team members to accomplish the stated objectives;
- Relative to a clearly defined baseline, the strength of the quantifiable metrics, milestones, Go/No-Go decision points, and a mid-point deliverables defined in the application, such that meaningful interim progress will be made; and
- Quality of the SOPO for the first two budget periods (Budget Period 1 and Budget Period 2) that describes the initial startup phase for the Institute and the initial technology development activities, as well as the overall plan for the full award project period.

Impact

- The quality of the market transformation plan for the initial proposed projects and technical work and the extent to which the applicant demonstrates the likelihood of successful technology adoption by industry, and supports energy efficient manufacturing technology development;
- Extent to which the applicant demonstrates a high and credible impact of the Institute for cybersecurity protection over ten years relative to existing available energy efficiency technologies;
- Extent to which the applicant demonstrates the potential impact of the Institute to support security and resiliency of U.S manufacturing and supply chain networks against cyber threats, such as greater energy efficiency, growth of domestic supply chain networks, number and quality of CVDs involving manufacturers, as well as regional economic development as a result of successful technology deployment and commercialization from Institute related activities over ten years; and
- Degree to which the applicant illustrates how DOE funding will enable acceleration of energy efficiency in manufacturing, and how the Institute will appropriately leverage existing resources that will result in more impactful outcomes, including but not limited to, DOE/NNSA National Laboratories, National Institute of Standards and Technology's MEP Centers, National Science Foundation's ATE Centers, national laboratories, and other government investments.

Criterion 2: Qualifications and Resources (25%)

- Quality of the Institute's key technical personnel and their level of technical capabilities and relevance to achieving the goals and objectives of the Institute and the FOA;
- Qualifications, relevant expertise, experience and time commitment of the proposed Institute Director/Chief Executive Officer and key management staff, e.g., Chief Financial Officer, Chief Technology Officer, Chief Operating Officer, in successfully managing a national effort to research and develop cybersecurity in energy efficient manufacturing technologies;
- The sufficiency of the existing and proposed equipment, facilities and capabilities to support the work and horizontal and vertical supply chain network activities;
- Adequacy of budget and spend plan for the proposed project to achieve the defined objectives;
- Adequacy of funding availability to encourage openness and new participants as the Institute goes forward, and to accommodate changes

in strategic direction that may occur once the Institute is formalized and aligned with strategic roadmaps; and
- Degree to which applicant demonstrates strong operational and financial capability and assets, and explains how these will be utilized to provide a full cadre of resources to support the applicant's role as Institute lead.

Criterion 3: Operations and Management (25%)

Management and Governance Approach
- Effectiveness of management approach and governance structure to enable strategic and technical decision-making;
- Degree to which the Institute can operate as an independent, neutral, non-biased coordinating and convening body for a diverse set of stakeholders;
- Adequacy of the inclusion of federal government (DOE and other federal government participants identified by DOE) on decision making and advisory bodies (boards/committees) at both a strategic and technical level within the Institute; and
- The adequacy and quality of the proposed participation structure (e.g., tiered membership structure, pay-for-use arrangements) including the benefits and restrictions for each level of participation (such as IP rights) to incentivize broad private sector participation (SMEs, minority-owned businesses, and women-owned businesses).

Operations
- The adequacy and quality of the annual planning process, including the strategic planning and industry roadmap activities, periodic update of the industry roadmap (annual or bi-annual) and incorporation of the industry roadmap to Institute strategic planning;
- Strength of the technical management plan for selecting and prioritizing R&D work, tracking performance, and planned periodic (annual) review of processes for Institute and project performance;
- Quality of the stakeholder engagement plan, and how it demonstrates openness to new participants, in particular with SMEs, minority-owned businesses, and women-owned businesses, and ability to engage stakeholders along the supply chain network including end-users;
- Adequacy of the discussion of the economic and operational key risk areas involved in the operations and management plan, and the quality of the mitigation strategies to address them, specifically with respect to Intellectual Property management and strengthening U.S. manufacturing competitiveness;
- The adequacy of the Institute's strategy to manage export control compliance;

- Degree to which the Institute can meet the goal of strengthening U.S. manufacturing competitiveness while engaging a wide range of stakeholders that may include foreign participants; and
- Adequacy of how metrics will be tracked to gauge success of the Institute and impact in the technology area.

Project Management

- Adequacy, reasonableness, and soundness of the proposed project management plan for accomplishment of the Institute objectives; and
- Extent to which the applicant demonstrates a strong level of integration across the Institute elements to provide value that is greater than the sum of the individual activities (i.e., how will the shared facilities support the technical education and workforce development plans and project activities).

Intellectual Property Management Plan

- Adequacy of the IP management plan for supporting the needs of the Institute and its participants, which addresses the precompetitive landscape and the broader U.S. manufacturing sector; and
- Quality of the IP Management plan and any other IP agreements (attached as an Appendix to the Narrative) demonstrating that the IP issues inherent with collaborations and/or multi-user facilities are addressed, including those outlined in Section VI.B.x of the FOA.

Transition Plan

- Likelihood that the Institute can achieve financial self-sufficiency from dedicated federal funding within five years; and
- Reasonableness of the extended profit and loss estimates for an additional three years beyond the award project period.

iii. Criteria for Replies to Reviewer Comments

EERE has not established separate criteria to evaluate Replies to Reviewer Comments. Instead, Replies to Reviewer Comments are attached to the original applications and evaluated as an extension of the Full Application.

B. Standards for Application Evaluation

Applications that are determined to be eligible will be evaluated in accordance with this FOA, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance," which is available at: https://energy.gov/management/downloads/merit-review-guide-financial-assistance-and-unsolicited-proposals-current.

C. Other Selection Factors

i. Program Policy Factors

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

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

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, EERE, in coordination with CESER, 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 EERE and CESER representatives to provide clarification on the contents of the Full Applications and to provide EERE and CESER an opportunity to ask questions regarding the proposed project. The information provided by

applicants to EERE through Pre-Selection Interviews contributes to EERE's selection decisions.

EERE will arrange to meet with the invited applicants in person at EERE's offices or a mutually agreed upon location. EERE 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 EERE and CESER via webinar, videoconference, or conference call.

EERE 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.

EERE may obtain additional information through Pre-Selection Interviews that will be used to make a final selection determination. EERE may select applications for funding and make awards without Pre-Selection Interviews. Participation in Pre-Selection Interviews with EERE and CESER does not signify that applicants have been selected for award negotiations.

iii. Pre-Selection Clarification

EERE 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, and will be limited to information already provided in the application documentation. 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 EERE's written clarification questions or video or conference calls with EERE representatives.

The information provided by applicants to EERE through pre-selection clarifications is incorporated in their applications and contributes to the merit review evaluation and EERE's selection decisions. If EERE 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.

EERE 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 C.F.R. § 200.205.

v. Selection

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

E. Anticipated Notice of Selection and Award Negotiation Dates

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

ii. Concept Paper Notifications

EERE will notify applicants of its determination to encourage or discourage the submission of a Full Application. EERE will post these notifications to EERE Exchange.

Applicants may submit a Full Application even if they receive a notification discouraging them from doing so. By discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. The purpose of the Concept Paper phase is to save applicants the considerable time and expense of preparing a Full Application that is unlikely to be selected for award negotiations.

A notification encouraging the submission of a Full Application does not authorize the applicant to commence performance of the project. Please refer to Section IV.J.ii of the FOA for guidance on pre-award costs.

iii. Full Application Notifications

EERE will notify applicants of its determination via a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE Exchange. The notification letter will inform the applicant whether or not its Full Application was selected for award negotiations. Alternatively, EERE 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.

iv. 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 EERE 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 EERE Exchange with whom EERE 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, EERE will cancel the award negotiations and rescind the Selection. EERE reserves the right to terminate award negotiations at any time for any reason.

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

v. Alternate Selection Determinations

In some instances, an applicant may receive a notification that its application was not selected for award and EERE designated the application to be an alternate. As an alternate, EERE 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. EERE may ultimately determine to select or not select the Full Application for award negotiations.

vi. Unsuccessful Applicants

EERE 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:

a. EERE Exchange

Register and create an account on EERE Exchange at https://eere-Exchange.energy.gov.

This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission. Applicants should also designate backup points of contact so they may be easily contacted if deemed necessary. **This step is required to apply to this FOA.**

The EERE Exchange registration does not have a delay; however, **the remaining registration requirements below could take several weeks to process and are necessary for a potential applicant to receive an award under this FOA**.

b. DUNS Number

Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including the plus 4 extension, if applicable) at http://fedgov.dnb.com/webform.

c. System for Award Management

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

d. 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.

e. Grants.gov

Register in Grants.gov (http://www.grants.gov) to receive automatic updates when Amendments to this FOA are posted. However, please note that Concept Papers, and Full Applications will not be accepted through Grants.gov.

f. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the Department of Energy, including EERE Exchange 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 Access Under DOE ORDER 142.3A, "Unclassified Foreign Visits and Assignments Program"

All applicants selected for an award under this FOA may be required to provide information to DOE in order to satisfy requirements for foreign nationals' access to DOE sites, information, technologies, equipment, programs or personnel. A

foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has not been naturalized under U.S. law. If a selected applicant (including any of its subrecipients, contractors or vendors) anticipates involving foreign nationals in the performance of its award, the selected applicant may be required to provide DOE with specific information about each foreign national to ensure compliance with the requirements for access approval. Access approval for foreign nationals from countries identified on the U.S. Department of State's list of State Sponsors of Terrorism must receive final approval authority from the Secretary of Energy or the Secretary's assignee before they commence any work under the 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.

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

EERE's decision whether and how to distribute federal funds under this FOA is subject to the National Environmental Policy Act (42 USC 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 http://nepa.energy.gov/.

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 costs to prepare the necessary records may be included as part of the project costs.

vii. 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 contactors 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, Form 4414, 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.

viii. Statement of Federal Stewardship

EERE will exercise normal federal stewardship in overseeing the project activities performed under EERE Awards. Stewardship Activities include, but are not limited to, conducting site visits; reviewing performance and financial reports, providing assistance and/or temporary intervention in usual 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.

ix. Statement of Substantial Involvement

DOE, through EERE and CESER, 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:

1. DOE shares responsibility with the recipient for the management, control, direction, and performance of the project.

2. DOE may intervene in the conduct or performance of work under the award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.

3. DOE may redirect or discontinue funding the project based on the outcome of DOE's evaluation of the Project at the Project-Wide Go/No-Go decision point(s).

4. DOE may redirect or discontinue funding for individual Institute Activities based on the outcome of DOE's evaluation of those activities at the Individual Institute Activity Go/No-Go decision points.

5. DOE participates in major project decision-making processes to include but not limited to:
    a. Completion of Roadmap
    b. Selection of Institute Activities;
    c. Individual Institute Activity Go/No-Go reviews; and
    d. Project redirection based on progress reviews.

6. DOE will appoint Federal Government representatives to participate in any Institute governance or management entities that may be established.

7. The recipient will provide DOE the opportunity to participate in the planning of technical, strategic, and operations events such as workshops and roadmapping activities.

8. The recipient will require a positive compliance recommendation from DOE prior to adopting any Institute-related documents and subsequent changes to such documents. The recipient will provide DOE with a minimum of five business days to review for compliance with the award. This includes but is not limited to bylaws, operational plan, risk management plan, Strategic Plans, RFP process, CRADAs, the membership agreement, the Intellectual Property Management Plans (IPMPs), the Data Management Plan, the COI Plan, the Export Control Management Plan, , NDA/COI form, Foreign Entity Participation Plan, conference management directive, planning documents listed in the SOPO, Cybersecurity Plan, Roadmap, CVD Execution Plan, and other key documents or policies for the Institute.

9. The recipient will provide DOE with timely notice of Institute related publicity information regarding the recipient's organization and the Institute. The recipient will provide DOE a minimum of five business days

to review and offer input. Related publicity information includes materials developed by the recipient, subrecipient, or other participant.

10. The recipient will provide DOE a minimum of five business days to review any Project and Institute Activity-specific risk mitigation and corrective action plans.

11. To adequately monitor project progress and provide direction to the Institute, the recipient must provide DOE the opportunity to participate in the Institute's activities including Institute meetings, key reviews and experiments, and project management and monitoring activities. The recipient must notify DOE a minimum of ten business days before the Institute activity and provide all appropriate documentation for DOE review.

12. DOE may choose to engage a private, independent engineering (IE) firm or third party consultant to assist in assessing the progress of the project and provide timely and accurate reports to DOE. The recipient will ensure that the IE or consultant has access to any and all relevant documentation sufficient to allow the IE or consultant to provide independent evaluations to DOE on the progress of the project. The recipient may require the IE or consultant to sign a nondisclosure agreement (NDA) and will negotiate the agreement in good faith and in a timely manner. Consultants to DOE may not provide technical direction to the recipient.

13. DOE will review all membership requests for consistency with U.S. manufacturing objectives and to assess whether the potential member would further the objectives of the award (e.g., advance cyber-secure process controls that enable greater manufacturing energy efficiency for securing automation, increase energy efficiency and security of supply chain networks in manufacturing, improve ability and time to detect and recover from cyber-attacks, address coordinated vulnerability disclosures, and revitalize American manufacturing and support domestic manufacturing competitiveness).

14. In addition to the list above, the recipient must obtain Government Approval in the following situations:

a. Scope changes, including but not limited to, any change in plans that may result in a need for additional federal funding;
b. NEPA-related documents and compliance activities;
c. Requests for Proposals for Institute Activities funded under the Institute;

d. Selection of new Institute Activities;
e. Selection of and subsequent changes to key personnel; and
f. Foreign Entity Participation and Foreign Work Waivers.

15. DOE reserves the right to make modifications and/or additions to this list based on future risk assessments and/or the specific Institute management approach enlisted by the recipient.

x. Intellectual Property Management Plan (IP Management Plan)

Prior to award, the recipient must submit an executed IP Management Plan between the Institute and Institute members.

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

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

- The treatment of confidential information between members (i.e., the use of non-disclosure agreements);
- The treatment of background IP (e.g., any requirements for identifying it or making it available);
- The treatment of inventions made under the project (e.g., any requirements for disclosing to the other members, 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 project (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.

xi. Updated Conflict of Interest (COI) Disclosure Statement

Due to the high profile nature of this Institute and its impact on U.S. manufacturing, it is important that any COIs, whether actual or perceived, affecting the key personnel for the Institute be identified and a mitigation plan be developed. Examples of conflicts of interest include, but are not limited to: financial holdings, business relationships, professional affiliations, and personal relationships and/or affiliations that currently exist or arise during the operation of the Institute involving foreign and domestic institutions and individuals. The disclosure statements must also identify any financial ties to foreign entities and any current or past work with foreign governments.

In addition to the COI Disclosure Statement submitted with the Full Application (see Section IV.D.xvii), the Selectee must submit an Updated COI Disclosure Statement that further identifies any and all potential conflicts of interest beyond those submitted with the application for the key personnel as defined by EERE, with any proposed mitigation efforts. This information will be due to EERE no later than seven (7) business days after notice of selection for award negotiations. All conflicts must be identified, documented and resolved through a COI mitigation and avoidance plan approved by the Contracting Officer. The Selectee must obtain this approval from the Contracting Officer prior to involvement by any representatives in any negotiations with EERE or Institute activities.

The recipient has an ongoing responsibility throughout the award to provide DOE with an updated or new COI Disclosure Statement for key personnel, when there are staffing changes or changes to an individual's circumstances that result in newly identified COIs.

In addition to the COI Disclosure Statement for key personnel, as the recipient becomes aware, the recipient must promptly notify the DOE Contracting Officer within ten (10) calendar days of any significant COI issues concerning the recipient, subrecipients, contractors or Institute Members. The notification must include: 1. A copy of the current COI policy; 2. A detailed description of the COI; and 3. A COI management plan that contains all the information and actions the applicant/recipient plans to take and has taken in order to manage, eliminate, neutralize, mitigate or otherwise resolve the COI. For purposes of this notice requirement, a significant COI will be deemed to exist when actual or apparent conflicts are disclosed involving: key personnel; governance board members; persons involved in project reviews or selections; persons involved in a procurement action over $25,000; and as otherwise defined in the award.

xii. Conflict of Interest (COI) Plan for the Institute

The Institute must establish a comprehensive COI Plan for the overall Institute. DOE will review and approve the COI Plan prior to award. The plan must

establish COI procedures, consistent with DOE's COI requirements. The procedures must set forth a consistent approach to identifying and mitigating Conflicts of Interest across the Institute members and include the key elements set forth in Appendix C– Key Elements of a COI Plan.

xiii. Risk Mitigation Plan

If selected for award negotiations, the details of the recipient's Risk Mitigation Plan will be subject to review and approval by EERE. The Risk Mitigation Plan will need to address control of sensitive information within the Institute and outside the Institute. Risks will be re-evaluated and the Risk Mitigation Plan updated in response to changes in policy. The recipient's Risk Mitigation Plan must be accepted by EERE prior to award.

Components for the Risk Mitigation Plan should include: (1) vetting of staff working on projects and (2) identifying, handling, and managing sensitive information. As part of a Risk Mitigation Plan, DOE will require the following conditions be included:

DOE reserves the right for final determination of identification, categorization and treatment of information generated through the Institute activities; and The recipient must document to the satisfaction of DOE that the recipient has properly vetted all individuals, including foreign nationals, proposed to participate in Institute projects in accordance with the Risk Mitigation Plan. This documentation must be provided to EERE with sufficient time for review prior to individuals' participation in project activities.

xiv. Export Control Management Plan

Export control laws are in place to protect U.S. national security, foreign policy, and economic interests without imposing undue regulatory burdens on legitimate international trade.

Some projects within the Institute may be subject to export control restrictions per the applicable laws and regulations. It is the prime recipient's responsibility to determine applicability with export control laws and regulations and ensure compliance. Export control laws and regulations may apply to individual research projects, depending on the nature of the research tasks.

Under no circumstances may foreign entities (organizations, companies or persons) receive access to export controlled information unless proper export procedures have been satisfied and such access is authorized pursuant to law or regulation.

If an applicant is selected for award negotiations, the applicant must submit an Export Control Management Plan during the award negotiations phase for review and approval by EERE. The Plan must be approved before an award will be made. The Export Control Management Plan should adequately demonstrate that the applicant has a strong understanding of and an adequate plan to manage export control compliance. The Export Control Management Plan should outline the specific compliance safeguards the Institute will implement across the Institute's activities. On an annual basis, the recipient must provide a compliance certificate signed by its legal counsel, which represents the recipient is in compliance with all export control obligations.

xv. Foreign Involvement

The recipient, subrecipients and Institute members must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States (See Section III).

A foreign entity may be eligible to become a recipient, subrecipient or Institute member, if the entity is able to demonstrate to the satisfaction of the Institute's leadership (applicable to proposed foreign entity subrecipients and Institute members) and DOE that: 1) its participation is in the best interest of the Institute, U.S. industry, and U.S. economic development; 2) adequate Intellectual Property (IP) and data protection protocols exist between the U.S. subsidiary and its foreign parent organization; 3) the work is conducted within the U.S., absent an approve foreign work waiver; 4) the entity acknowledges the U.S. Manufacturing Plan; and 5) the foreign entity will satisfy other conditions that may be deemed necessary by the Institute or DOE to protect U.S. government interests. Appendix B lists the necessary information that must be included in a foreign entity participation waiver.

If an applicant is selected for award negotiations, the applicant must develop a Foreign Entity Participation Plan that describes how it will handle the participation of foreign entities that engage in Institute activities while ensuring alignment with the overall Institute's goals to enable greater manufacturing energy efficiency of the U.S. It must also address how the recipient will ensure compliance with the restrictions on participation in foreign government talent recruitment programs. See Section VI.B. xxiii. The Foreign Entity Participation Plan must be incorporated into the membership agreement by reference. The Foreign Entity Participation Plan is subject to DOE review and approval.

xvi. Limitations on Compensation Costs

For an award issued under this FOA, the annual compensation costs allowable for an individual proposed as a direct cost under the award are limited to $250,000, equivalent to an hourly rate of $120/hour (i.e., $250,000, or $120/hour, is the maximum amount that EERE will reimburse a recipient for any one individual's annual compensation and EERE will not recognize such costs above $250,000, or $120/hour as recipient cost share).

This limitation does not restrict the recipient or its subrecipients from providing annual compensation to an individual that exceeds $250,000, or $120/hour. However, any amount above $250,000, or $120/hour cannot be included as a direct cost in the total project costs (i.e., federal share or recipient cost share). For purposes of the applicable award term only, the term "annual compensation costs" is defined to include the total amount of wages, salary and monetary bonuses paid to the employee, which have been approved by the Contracting Officer.

Compensation for individual vendor/contractor services must be reasonable and consistent with that paid for similar services in the marketplace. The allowable vendor/contractor rate is limited to $960/day or $120/hour. This limitation does not restrict the recipient or its subrecipients from providing a vendor/contractor rate that exceeds the $960/day or $120/hour. However, any amount above the $960/day or $120/hour cannot be included as a direct cost in the total project costs (i.e. federal share or recipient cost share).

Consultants with substantial programmatic interest, control or authority will be treated as subrecipients and may not incur fee or profit for their work under the DOE Cooperative Agreement. For consultants without substantial programmatic interest, control or authority, see vendor/contractor rate limitations above.

xvii. Subject Invention Utilization Reporting

In order to ensure that prime recipients and subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, EERE may require that each prime recipient holding title to a subject invention submit annual reports for 10 years from the date the subject invention was disclosed to EERE 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 EERE may specify.

xviii. Intellectual Property Provisions

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

xix. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, attached to the award agreement. This helpful EERE checklist can be accessed at https://www.energy.gov/eere/funding/eere-funding-application-and-management-forms. See Attachment 2 Federal Assistance Reporting Checklist, after clicking on "Model Cooperative Agreement" under the Award Package section. In addition to the standard reporting requirements included in the template Federal Assistance Reporting Checklist, the Institute must submit an annual report to DOE summarizing the activities of the Institute, including –

- Detailing organizational expenditures; and
- Describing each project undertaken by the Institute

This annual reporting will be required each year during the award project period and annually for five years after the award project period.

xx. Go/No-Go Review

The award selected under this FOA will be subject to a periodic evaluation referred to as a Go/No-Go Review. The terms and conditions of the award will establish two types of Go/No-Go decision points: The Institute "Project-Wide" and "Individual Institute Activity-level" (See Glossary in Appendix J for definitions). For each Go/No-Go decision point, EERE, in partnership with CESER, must determine whether the recipient has fully and satisfactorily completed the work described in the SOPO. At each the Project-Wide Go/No-Go decision points, EERE, in partnership with CESER, will evaluate performance, schedule adherence, the extent milestone objectives are met, compliance with reporting requirements, strategic plan execution, alignment to the Roadmap, and overall coordination and contribution to the EERE program goals and objectives.

As a result of a Project-Wide Go/No-Go review, in its discretion, DOE may take one of the following actions:

1. Authorize federal funding for the next budget period for the Project;
2. Recommend redirection of work under the Project;
3. Discontinue providing federal funding for the Project beyond the current budget period as the result of insufficient progress, change in strategic direction, or lack of available funding; or
4. Place a hold on the federal funding for the Project, pending further supporting data.

As a result of an Individual Institute Activity Go/No-Go review, in its discretion, DOE may take one of the following actions:

1. Authorize funding (federal share and cost share) for the next budget period for the Institute Activity;
2. Recommend redirection of work under the Institute Activity;
3. Discontinue providing funding for the Institute Activity beyond the current budget period as the result of insufficient progress, change in strategic direction, or lack of available funding; or
4. Place a hold on the funding (federal share and cost share) for the Institute Activity, pending further supporting data.

As part of a Project-Wide Go/No-Go review, DOE may consider the outcome of an Individual Institute Activity Go/No-Go review. However, except where the Individual Institute Activity has a detrimental or significant impact on the Project as whole, the decision to discontinue federal funding for an Individual Institute Activity will not in itself result in a decision to discontinue federal funding for the Project as whole.

Federal funding beyond each Project-Wide 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) the recipient's technical progress compared to the Milestone Summary Table included in the award; (4) the recipient's submittal of required reports (see Section VI.B.xix); (5) the recipient's compliance with the terms and conditions of the award; (6) EERE's Project-Wide Go/No-Go decision; (7) the recipient's timely submission of a continuation application; and (8) written approval of the continuation application by the Contracting Officer.

A 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.

xxi. 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.

See Appendix F for further requirements concerning conference spending directly and programmatically related to the purpose of an award issued under this FOA. Further, if an applicant is selected for award negotiations, the applicant must submit a conference management directive during the award negotiations phase for review and approval by EERE. The directive must be approved before an award will be made.

xxii. 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:

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.

xxiii. Foreign Government Talent Recruitment Programs

One of the primary purposes of the Institute is to increase U.S. manufacturing competitiveness by strengthening the security and economic resilience of U.S. manufacturing. Participation in a foreign government talent recruitment program could conflict with this objective by resulting in unauthorized transfer of scientific and technical information to foreign government entities. Therefore, no individual on a project team for the Institute may participate in foreign government talent recruitment programs of countries designated by DOE as a foreign country of risk. The purpose of this requirement is to ensure the continued flow of scientific and technical information consistent with DOE's

broad scientific mission, while also ensuring protection of U.S. competitive, economic and national security interests and DOE program objectives; and limiting unauthorized transfers of scientific and technical information. Special terms and conditions and reporting obligations implementing this requirement will be incorporated into any award issued under this FOA.

Prior to award, the selectees must certify to DOE in their initial disclosures, based on due diligence, that all individuals on the project team, including the prime recipient, subrecipients, contractors, members, and any other party, are not participants in foreign government talent recruitment programs of countries designated by DOE as a foreign country of risk.

During the award performance, recipients will be required to continue to exercise due diligence and regularly file reports with certifications to DOE on whether there is a reasonable basis to report that any individual on the project team for the award is a participant in a foreign government talent recruitment program of a foreign country of risk. 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. All individuals on the project team must submit a signed statement to DOE within the first quarter of the award or within thirty days of joining the project team, which (1) certifies the individual is not a participant in a in a foreign government talent recruitment program of a foreign country of risk, and (2) discloses the individual's ties to foreign universities, private entities and governments of countries designated by DOE as foreign country of risk.

In general, foreign government talent recruitment programs include any foreign-state-sponsored attempt to acquire U.S. scientific-funded research or technology through foreign government-run or funded recruitment programs that target scientists, engineers, academics, researchers, and entrepreneurs of all nationalities working or educated in the United States. These recruitment programs are often part of broader whole-of-government strategies to reduce costs associated with basic research while focusing investment on military development or dominance in emerging technology sectors.

Distinguishing features of a foreign government talent recruitment program covered by this paragraph include:

a) Compensation provided by the foreign state to the targeted individual in exchange for the individual transferring their knowledge and expertise to the foreign country. The compensation can take several forms, such as cash,

research funding, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration.

b) Recruitment in this context refers to the foreign-state-sponsor's active engagement in attracting the targeted individual to join the foreign-sponsored program and transfer their knowledge and expertise to the foreign state. The targeted individual may be employed and located in the U.S., or in the foreign state. Recruitment would not necessarily include any invitation for engagement extended by the foreign state, for example, an invitation to attend or present work at an international conference.

c) Many, but not all, programs aim to incentivize the targeted individual to physically relocate to the foreign state. Of particular concern are those programs that allow for continued employment at U.S. research facilities or receipt of DOE research funds while concurrently receiving compensation from the foreign state.

VII. Questions/Agency Contacts

Upon the issuance of a FOA, EERE 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, questions regarding the content of this FOA must be submitted to: cemii@ee.doe.gov. Questions must be submitted not later than 3 business days prior to the application due date and time. Please note, feedback on individual concepts will not be provided through Q&A.

All questions and answers related to this FOA will be posted on EERE Exchange at: https://eere-exchange.energy.gov. **Please note that you must first select this specific FOA Number in order to view the questions and answers specific to this FOA**. EERE 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 related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

VIII. Other Information

A. FOA Modifications

Amendments to this FOA will be posted on the EERE Exchange website and the Grants.gov system. However, you will only receive an email when an amendment or a FOA is posted on these sites if you register for email notifications for this FOA in Grants.gov. EERE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments or other FOAs.

B. Informational Webinar

EERE will conduct one informational webinar during the FOA process. It will be held after the initial FOA release but before the due date for Concept Papers.

Attendance is not mandatory and will not positively or negatively impact the overall review of any applicant submissions. As the webinar will be open to all applicants who wish to participate, applicants should refrain from asking questions or communicating information that would reveal confidential and/or proprietary information specific to their project. Specific dates for the webinar can be found on the cover page of the FOA.

C. Government Right to Reject or Negotiate

EERE 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.

D. 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.

E. Treatment of Application Information

In general, EERE will only use data and other information contained in applications for evaluation purposes, unless such information is generally available to the public or is already the property of the Government.

Applicants should not include trade secrets or commercial or financial information that is privileged or confidential 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.

The use of protective markings such as “Do Not Publicly Release – Trade Secret” or “Do Not Publicly Release – Confidential Business Information” is encouraged. However, applicants should be aware that the use of protective markings is not dispositive as to whether information will be publicly released pursuant to the Freedom of Information Act, 5 U.S.C. §552, et. seq., as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175. (See Section I of this document, “Notice of Potential Disclosure Under the Freedom of Information Act (FOIA)” for additional information regarding the public release of information under the Freedom of Information Act.

Applicants are encouraged to employ protective markings in the following manner:

The cover sheet of the application must be marked as follows and identify the specific pages containing trade secrets or commercial or financial information that is privileged or confidential:

> Notice of Restriction on Disclosure and Use of Data:
> Pages [list applicable pages] of this document may contain trade secrets or commercial or financial information that is privileged or confidential, and is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

The header and footer of every page that contains trade secrets or commercial or financial information that is privileged must be marked as follows: "May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure."

In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be enclosed in brackets.

F. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Project-Wide Go/No-Go Review, the Individual Institute Activity Go/No-Go review and peer review, 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 EERE contractors. The applicant, by submitting its application, consents to the use of non-federal reviewers/administrators. Non-federal reviewers must sign COI and NDAs prior to reviewing an application. Non-federal personnel conducting administrative activities must sign a NDA.

G. 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.

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

EERE 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).

I. Notice of Potential Disclosure Under Freedom of Information Act (FOIA)

Under the Freedom of Information Act, (FOIA), 5 U.S.C. §552, et. seq., as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175, any information received from the applicant is considered to be an agency record, and as such, subject to public release under FOIA. The purpose of the FOIA is to afford the public the right to request and receive agency records unless those agency records are protected from disclosure under one or more of the nine FOIA exemptions. Decisions to disclose or withhold information received from the applicant are based upon the applicability of one or more of the nine FOIA exemptions, not on the existence or nonexistence of protective markings or designations. Only the agency's designated FOIA Officer may determine if information received from the applicant may be withheld pursuant to one of the nine FOIA exemptions. All FOIA requests received by DOE are processed in accordance with 10 C.F.R. Part 1004.

J. 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.

K. Retention of Submissions

EERE expects to retain copies of all Concept Papers, Full Applications, Replies to Reviewer Comments, and other submissions. No submissions will be returned. By applying to EERE for funding, applicants consent to EERE's retention of their submissions.

L. 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, unless DOE agrees that the commitments proposed in the U.S. Manufacturing Plan are sufficient.

- Advance and Identified Waivers: applicants 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 EERE within the timeframes set forth in the award's intellectual property terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.
- Determination of Exceptional Circumstances (DEC): Each applicant is required to submit a U.S. Manufacturing Plan as part of its application. If selected, the U.S. Manufacturing Plan shall be incorporated into the award terms and conditions for domestic small businesses and nonprofit organizations. DOE has determined that exceptional circumstances exist that warrants the modification of the standard patent rights clause for small businesses and non-profit awardees under Bayh-Dole to the extent necessary to implement and enforce the U.S. Manufacturing Plan. For example, the commitments and enforcement of a U.S. Manufacturing Plan may be tied to subject inventions. Any Bayh-Dole entity (domestic small business or nonprofit organization) affected by this DEC has the right to appeal it.

M. Government Rights in Subject Inventions

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

1. 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.

2. March-In Rights

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

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

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

N. 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 EERE 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.

O. Copyright

The prime recipient and subrecipients may assert copyright in copyrightable works, such as software, first produced under the award without EERE 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.

P. Personally Identifiable Information (PII)

All information provided by the applicant must to the greatest extent possible exclude Personally Identifiable Information (PII). The term "personally identifiable information" 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 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 C.F.R. § 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 C.F.R. § 200.501 and Subpart F.

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

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms "cost sharing" and "cost matching" are often used synonymously. Even the DOE Financial Assistance Regulations, 2 CFR 200.306, use both of the terms in the titles specific to regulations applicable to cost sharing. EERE 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. 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 an EERE 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, EERE 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, EERE generally does not allow pre-award costs prior to the signing of the Selection Statement by the EERE 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 sub-recipients. 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.

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

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

(A) Acceptable contributions. All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the prime recipient's cost sharing if such contributions meet all of the following criteria:

(1) They are verifiable from the recipient's records.

(2) They are not included as contributions for any other federally-assisted project or program.

(3) They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.

(4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:

a. For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A–122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the Federal Acquisition Regulation, 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

b. Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.

(5) They are not paid by the Federal Government under another award unless authorized by federal statute to be used for cost sharing or matching.

(6) They are provided for in the approved budget.

(B) Valuing and documenting contributions

(1) Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:

a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or

b. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.

(2) Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

(3) Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

(4) Valuing property donated by third parties.

- **a.** Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.
- **b.** Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:
  - **i.** The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
  - **ii.** The value of loaned equipment must not exceed its fair rental value.

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

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

APPENDIX B – Waiver Requests and Approval Processes: 1. Foreign Entity Participation; and 2. Performance of Work in the United States (Foreign Work Waiver)

1. Waiver for Foreign Entity Participation

As set forth in Section III.A., the prime recipient, subrecipients and Institute members must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Waiver Criteria

EERE invests in research and development as part of the DOE's broad portfolio approach to addressing our Nation's energy and environmental challenges. Specific to the Energy-Cybersecurity in Energy Efficient Manufacturing Institute, EERE seeks to advance cybersecurity in energy efficient manufacturing in the U.S. To ensure that purpose is not frustrated by foreign involvement, foreign entities seeking to participate in the Institute must demonstrate to the satisfaction of the Institute leadership (applicable to proposed foreign entity subrecipients and Institute members) and EERE that:

a. Its participation is in the best interest of the Institute, U.S. industry, and U.S. economic development;

b. Adequate Intellectual Property (IP) and data protection protocols exist between the U.S. subsidiary and its foreign parent organization;

c. The work is conducted within the U.S. and the entity acknowledges the U.S. Manufacturing Plan; and

d. The foreign entity will satisfy other conditions that may be deemed necessary by the Institute or DOE to protect U.S. interests.

Content for Waiver Request

A Foreign Entity Participation waiver request must include the following:

a. Information about the entity: name, point of contact, and proposed type of involvement with the Institute, and DUNS number for the proposed foreign participant and any foreign parent organization;
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 in the Institute (must address the waiver criteria stated above);

d. A description of the project's anticipated contributions to the U.S. economy:
    i. How the foreign entity's participation 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.;
    ii. How the foreign entity's participation will promote domestic manufacturing of products and/or services;
e. A description of why 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 for a foreign work waiver).

EERE 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.

EERE may require additional information before considering the waiver request.
The applicant does not have the right to appeal EERE'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.J.iii, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the prime recipient should make every effort to purchase supplies and equipment within the United States. There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a foreign work waiver, the applicant must submit an explicit waiver request in the Full Application. A separate waiver request must be submitted for each entity proposing to perform of work outside of the United States.
Overall, a waiver request must demonstrate to the satisfaction of EERE 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:

a. The rationale for performing the work outside the U.S. ("foreign work");

b. A description of the work proposed to be performed outside the U.S.;
c. An explanation as to how the foreign work is essential to the project;
d. A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the U.S. economy:
    - The associated benefits to be realized and the contribution to the project from the foreign work;
    - 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.;
    - How the foreign work will promote domestic manufacturing of products and/or services;
e. A description of the likelihood of Intellectual Property (IP) being created from the foreign work and the treatment of any such IP;
f. The total estimated cost (DOE and recipient cost share) of the proposed foreign work;
g. The countries in which the foreign work is proposed to be performed; and
h. The name of the entity that would perform the foreign work.

EERE may require additional information before considering the waiver request.
The applicant does not have the right to appeal EERE's decision concerning a waiver request.

APPENDIX C – KEY ELEMENTS OF A CONFLICT OF INTEREST (COI) PLAN

Prior to award, the Institute must establish COI procedures with a consistent approach to identifying and mitigating COIs across the Institute and in agreement with DOE's procedures. Throughout the FOA, this is referred to as the COI Plan. The COI procedures can be defined in a stand-alone document that is incorporated into other operating documents by reference. The COI Plan is subject to DOE review and approval. In preparing the Institute's COI Plan, the plan should:

1. Define what constitutes a COI. (At a minimum, should cover financial conflicts, organizational conflicts, and close relationships – actual and apparent).

2. Identify what positions are covered by the COI Plan.

3. Provide the means for individuals to disclose information that may help identify COIs (e.g., annual disclosure forms) and identifies who is responsible for collecting this information.

4. Identify the level at which determinations of whether a conflict exists are made, and level at which actual conflicts are reviewed and how they will be reviewed.

5. Describe what records will be maintained in relation to COIs and the time period for maintaining those records.

6. Include procedures for managing COIs. Provides examples of possible mitigation measures for guidance in developing specific mitigation plans.

7. Include adequate enforcement mechanisms and provides for sanctions where appropriate.

8. Include the procedure for providing required COI disclosures and proposed mitigation/avoidance plan to DOE. Disclosures to DOE should be in writing and include: 1) A copy of the current COI plan; 2) A detailed description of the COI; and 3) the individual COI mitigation plan that contains the actions to be taken in order to manage, eliminate, neutralize, mitigate or otherwise resolve the COI.

9. Provide for acknowledgement by persons covered by the COI Plan that he/she has read and understands the plan, and agrees to promptly disclose any potential COIs that may arise.

10. Satisfy the requirements of 2 CFR 200.318 (e.g., recipient must have written standards of conduct covering COI and governing the performance of its employees engaged in the selection, award, and administration of contracts and written standards regarding organizational conflicts).

11. Ensure the appropriate disclosures of financial ties to foreign universities, private entities and governments are reported to the appropriate entities, including DOE. These disclosures should also include any participation in foreign government talent recruitment program of a foreign country of risk.

12. Require identification of current and past work with foreign governments.

Once a COI is identified, one course of action is to establish a COI Mitigation Plan. In some instances (e.g., COIs involving key personnel for the Institute) it may be necessary to submit the COI Mitigation Plan to DOE. A COI Mitigation Plan should:

1. Detail what the specific COI is;

2. Describe specific mitigation measures that will be taken for the identified COI;

3. Discuss what corrective actions will be taken should the covered party fail to adhere to the mitigation plan; and

4. Provide for acknowledgement by the covered party that he/she has read, understands, and agrees to comply with the plan.

APPENDIX D – ELEMENTS OF THE INSTITUTE MEMBERSHIP AGREEMENT

The recipient must work closely with its members and DOE to establish and operate a coordinated Institute for Cybersecurity in Energy Efficient Manufacturing. Each member of the Institute must enter into a membership agreement that sets forth the terms and conditions of the membership, and by which the members agree to be subject to the governance structure and the Institute policies.

As part of the Full Application, each applicant must submit a draft membership agreement. (see Section IV.D.xix). The draft membership agreement will be evaluated as part of DOE's rigorous merit review procedures. If selected for award, the membership agreement must be final before an award is issued.
To help the applicants prepare a membership agreement, below is a list of key elements that should be included:

1. The rights and responsibilities of the Institute and the members;
2. Membership fees and cost share commitment requirements;
3. How the Institute and members will work together to collaborate to achieve the overall Institute mission and goals;
4. Data Sharing and publication policies (the draft Membership Agreement can incorporate the Data Management Plan submitted with the Full Application or at the very least needs to be consistent with the Data Management Plan submitted with the Full Application);
5. Incorporation of the Institute's operational documents (e.g., policies, plans) and governance documents (e.g., bylaws, charter) to make such documents binding on the parties;
6. The dispute resolution requirements; and
7. Other terms or articles the Institute deems necessary.

Additional Reminders

It is also important that the Institute develop membership application requirements and have a written outline of the overall membership structure and types of membership.

Circulate Agreement with Members: Please keep in mind that the membership agreement must be in place prior to award. To avoid delays, applicants are strongly encouraged to circulate the proposed membership agreement amongst its proposed members prior to submitting it to DOE during the application phase.

Incorporate Key Plans: The final membership agreement will need to explain how intellectual property, export control, communications, foreign participation, and conflicts of interest will be managed across the Institute and ensure the provisions are binding on the members. The final

membership agreement can incorporate the Intellectual Property Management Plan, the Data Management Plan, the Export Control Management Plan, and the COI Plan by reference.

APPENDIX E – COST MANAGEMENT GUIDANCE FOR INSTITUTES

This appendix is intended to assist applicants in understanding how to manage costs and safeguard taxpayer dollars from fraud, waste and abuse if they were to be selected as part of the new Clean Energy Manufacturing Innovation Institute (Institute). As recipients of taxpayer dollars, the Institutes must ensure prudent use of the public funds, as well as implement good internal controls to prevent mishandling of funds and protect against loss.
Key Points:

1. Recipients must take affirmative actions to safeguard taxpayer dollars, and protect against fraud, waste and abuse.

2. Recipients must adhere to the laws and regulations governing financial assistance awards.

3. It is vital that the prime recipient pay careful attention to the spending of not only its own organization, but that of its partners receiving federal funding and/or providing cost share as part of the award. Ultimately the prime recipient is responsible for award spending and meeting cost sharing requirements regardless of which entity is actually performing the work. As such, organizational leadership should set the tone from the top that spending must be reasonable. Institute policies and procedures should reflect this priority.

4. Awards are subject to periodic audit by DOE, by one of DOE's contractors, by the Government Accountability Office, and by the Inspector General. Some audit reports are publicly posted.

5. Finally, to be sustainable long term, it is critical that the Institutes efficiently manage their costs.

1. Managing Costs

The goal of each Institute is sustainable operations that continue to make a significant, positive impact on U.S. manufacturing. Consequently, efficient and effective cost management is key.

1.1 INTERNAL MEETINGS

Meetings with the internal project team and meetings between the prime recipient, subrecipients, and project partners are considered internal meetings. The Institutes have a lot of these meetings, and while important and productive in many cases, meetings also raise issues related to cost control and allowability as a direct project cost. Several of the Institutes have "distributed models" with many of the Institute employees working from "duty stations"

at their homes rather than in the primary office of the Institute. Meetings between Institute employees in various locations are a natural consequence of this type of model. However, travel/meeting costs can quickly become prohibitive, taxing the budgets of Institute "start-ups." Therefore, each Institute should consider the following when planning an internal meeting:

- Can the meeting be held virtually? Every effort should be made to conduct meetings via webinar, teleconference, or video conference. In-person, face-to-face meetings should only be held when necessary and no other option exists to conduct the business without travel and related costs.

- Can the meeting be held at a location and time to coincide with other required Institute travel? For example, if the Institute is holding a workshop, can the internal meeting be held before or after the workshop at the same location?

- If a face to face meeting is required and does not coincide with other required Institute travel, a location should be selected which requires the least amount of travel/limits costs for the participants. Institutes should try to hold the meeting where a room can be obtained at minimal to no cost (e.g., a headquarters conference room or university library). Further, avoid choosing a location that requires a food purchase minimum in order to use the space, unless the food minimum per person is consistent with the federal per diem for that location. Meeting room expenses are allowable if there is not adequate space at the Institute headquarters.

Keep in mind that providing food for meeting participants is generally not an allowable project cost. Meal expenses are only an allowable project cost for those individuals on official Institute travel. If food is ordered in for the meeting, those not on travel should put in non-project funds for their portion of the meal and those on travel should remove the per diem amount for that meal from their travel costs. Only those on official business travel (further than 50 miles from their duty station) can be reimbursed for these meals.

Board meetings, governance board meetings, and advisory committee meetings are also considered internal meetings. In addition to the above guidance, the Institutes should keep in mind that meals before or after board meetings or governance board meetings are considered "entertainment costs" and are unallowable as direct project costs. Those on official travel can have this cost covered under their travel expenses, but the amount charged to the award must be reasonable.

1.2 EXTERNAL MEETINGS

When planning, hosting, sponsoring, or otherwise holding an external meeting or conference (e.g., a Members Meeting), each Institute is expected to review all planned meeting costs to ensure that such costs are reasonable and necessary, including all of the categories of costs listed below:

- Meeting space
- Audio-visual equipment and services

- Printing and distribution
- Meals provided at the event
- Refreshments
- Lodging
- Air travel to/from the meeting
- Local transportation (e.g., rental car, privately owned vehicle to-and-from-the airport, taxi)
- Staff time associated with planning and holding the meeting

Hotels and vendors often offer concessions (free or discounted items/services) that reduce costs. The Institutes are encouraged to accept non-perishable concessions from hotels or vendors that would reduce costs instead of concessions on perishable items such as food. Examples of such non-perishable concessions include discounts on audiovisual services or equipment, meeting space, and parking costs.

Location & Venue

When selecting a location and venue for the meeting, the Institutes should conduct price comparisons of multiple facilities in multiple locations. Minimizing costs must be a critical consideration when determining the city and facility in which to hold a conference. Cost comparisons should include the following:

- Overall facility cost
- Availability of lodging at per diem rates
- Convenience of location
- Availability of meeting space, equipment, and supplies
- Commuting/travel distance for attendees

The Institutes must exercise special care when considering holding a meeting in any location that may give rise to appearance issues. Each Institute must ensure that the choice to hold a meeting in such a location is made only when there is a determination that it is the most cost-effective option.

Food and Beverage

Budgetary considerations must be kept in mind in determining the feasibility and prudence of expending federal funds to pay for food and beverages for meeting attendees. Food and beverage costs can be significant at an event – pay careful attention to these costs and whether they are truly necessary for a successful event. One approach that has been successful for some of the Institutes is requiring attendees to pay a registration fee to cover most or all of the food provided at the meeting. This would not only help with offsetting the costs of the meeting, but it also helps with event planning (provides a more accurate gauge of the number of committed attendees). The costs associated with the meeting/conference and the associated registration fees must be included in the project budget and as cost share in the budget in order for the registration fees to be used to offset the meeting/conference costs. If the registration fees are not included as part of the approved cost share, the budget must either be modified to increase the cost share and include these costs, or the registration fees must be accounted for as

Program Income and would be subject to the Addition Method, and not allowable to be used towards the meeting/conference expenses.

Institutes should explore further minimizing costs to the award for food or other special events by having sponsors cover these costs outside of the award (e.g., the state or an industry partner with a facility that can be toured by members). Please remember per 2 C.F.R. 200.438, "costs of entertainment including amusement, diversion, and social activities and any associated costs are unallowable, except where specific costs that might otherwise be considered entertainment have a programmatic purpose and are authorized either in the approved budget for the federal award or with prior written approval of the federal awarding agency."

Meeting Materials, Gifts, and Mementos
Every effort should be made to provide meeting materials to participants electronically or via print-on-demand services/options. Printed materials should maximize paper usage (printing on both sides) and minimize higher cost options (color printing) where possible.

Institutes should eliminate or limit the number of gifts and mementos (e.g., hats, mugs, gift bags) given out at external meetings. Think about whether doing so truly furthers the purposes of the award and whether such practices are sustainable.
See 2 C.F.R. 200.432 for further guidance on what is considered a "conference" and allowable costs.

1.3 TRAVEL
Given the national scope of each Institute, travel is necessary, so long as it supports and is required to meet the objectives and goals of the Institute. However, travel costs are a common source of issues in invoices around allowability/reasonableness and a key source of "findings" during audits. Therefore, each Institute must carefully review the applicable travel regulations and its own travel policy to ensure invoiced costs are allowable, allocable and reasonable as direct project expenses. When planning for travel, Institutes should:

- Book travel as soon as possible to avoid higher costs to the award.
- Book hotel rooms that have a "no penalty" cancellation policy, when available.
- Use the General Services Administration (GSA) per diem rates as a guideline for reasonableness of costs for hotels and meals. This is what DOE uses when reviewing Institute invoices.
- If the GSA rate for a hotel is not available where the meeting is being held (i.e., the conference hotel), look within a reasonable distance from the meeting location for a room within the GSA rate. Costs that are outside of GSA per diem guidelines require further justification for approval. Justification needs to include efforts taken to get costs within per diem rates and efforts to minimize the costs.
- Carefully evaluate the benefits of attending external conferences before committing to them. Conferences can be an excellent venue for information-sharing, promoting Institute projects and engagement, reporting on progress, among other things. However, given the costs associated with such travel, Institutes must be cognizant of the

number of conferences attended, as well as the number of attendees, to ensure that funds are being spent prudently.

- Costs must be reasonable for federal standards. Costs for lavish and extravagant travel are not reasonable. For example, the difference between economy airfare and a higher-class airfare is unallowable, except in very limited circumstances set forth in the governing cost principles.

1.4 ADDITIONAL CONSIDERATIONS FOR FOREIGN TRAVEL

All foreign travel requires PRIOR approval from the Contracting Officer and should be limited as much as possible. Foreign travel approval requests need to have a clear connection to the project's work scope, and must contain a complete estimate of the travel expenses. Federal per diem rates should be used as the basis. Institutes need to allow DOE a reasonable amount of time to review foreign travel requests (four to six weeks in advance of the travel date to allow for early booking of travel to reduce cost and address any questions or concerns that may arise during the review is recommended). The request must include the following:

- Names and positions of the people travelling
- Travel dates
- Travel destination(s)
- Estimated travel costs for each person (airfare, per diem, ground travel)
- Total estimated cost for all travelers (including the federal share and cost share)
- Purpose of the trip, including how the travel connects to the SOPO activities, how it furthers the mission of the Institute, how it benefits the government, and why it is necessary for the success of the Institute.

1.5 TRAVEL PAID FOR BY A THIRD-PARTY

There is no DOE approval required for travel (foreign or domestic) that is occurring outside of the scope of the DOE award, i.e., not cost share or federal share. However, if the travel is outside the U.S. (foreign travel), and the third-party wants the travel to be used as cost share, then the travel must be approved by DOE. DOE approval does not supplant other Federal Government approvals that may be required for foreign travel (e.g., Office of Foreign Assets Control). Further, personnel time while on travel, if covered by the Institute, needs DOE approval.

2. Allowable and Unallowable Costs

2.1 PROPOSAL DEVELOPMENT

There are three types of activities leading up to the selection of activities for inclusion in the Institutes SOPO and scope of work:

1. Roadmapping – understanding gaps, barriers, doing roadmap workshops, meetings, and other engagements with industry to lay out the missing pieces and approaches to help achieve the Institute goals and objectives.
2. Member engagement – developing an understanding among members about capabilities, resources and areas of interest for research and development.

3. Proposal creation – translating a project idea into a formal submission to the Institute decision making process before it has been selected to be included in the Institute scope of activities.

While roadmapping costs and membership engagement costs may be allowable as direct costs to the award, proposal creation cannot be a direct cost because the project is not yet formally a part of the award (if the proposal is rejected there is no benefit to the Institute). However, proposal creation costs for the current period may be allowable as an indirect cost, if applicable to the member.

2.3 COST SHARE

- Cost share may be provided by the prime recipient and/or any subrecipients. Third-party in-kind donations are also allowable cost share. Vendors/contractors may not provide cost share.
- Cost share must be actually incurred costs and verifiable.
- Cost share must be committed either with a signed commitment letter or a signed project agreement.
- Unallowable cost share includes discounts and avoided costs, as well as fee/profit.

3. Salary Waiver Request

A waiver, approved by the Contracting Officer, is required for inclusion of salaries of Institute employees or subrecipient employees that exceed $250,000 annually. This annual salary equates to a rate of $120/hour. Compensation for individual vendor/contractor services must be reasonable and consistent with that paid for similar services in the marketplace. The allowable vendor/contractor rate is limited to $960/day or $120/hour. All employees and vendor/contract services (prime recipient and subrecipients) with a proposed a rate of more than $120/hour (regardless of the amount of hours proposed for the project) will be required to have an approved salary waiver, if asking for reimbursement for their full rate. The waiver request should include the following:

- The position description of the employee for which the waiver requests applies;
- The proposed annual compensation, including the estimated hours to be performed on the Award and the rate at which the employee is paid;
- A rationale for the need of the employee on the Award and how their participation is necessary for the success of the project objectives

As a best practice, DOE recommends putting the waiver request in an excel document with the following information (example below):

Name	Institution	Title	Job Description	Proposed Annual Comp	$/hour	Estimated Hours	Rationale
							NAME is the School Chair in the School of **XXXX** Engineering at **XXX University**. He has published over 300 peer-reviewed

							articles and a textbook on **XXXX**…

4. Subrecipient Monitoring

The purpose of subrecipient monitoring is to ensure that the subaward is being used for the authorized purpose, in compliance with the federal program and financial assistance requirements, laws, and regulations, and the subaward performance goals are achieved. As part of the subrecipient monitoring, the Institutes should watch for unnecessarily extravagant or excessive expenditures.

5. Fraud, Waste and Abuse

Unfortunately, some recipients and subrecipients have misused award funds in multiple ways ranging from award mismanagement to intentional criminal fraud. Due to the complexity of the Institutes and the large number of project partners, the Institutes must be proactive to effectively minimize the risk of fraudulent use of the federal funds.

Fraud occurs when someone uses intentional misrepresentation or misleading omission to receive something of value or to deprive someone, including the government, of something of value.

Waste occurs when taxpayers do not receive reasonable value for their money in connection with a government-funded activity due to an inappropriate act or omission by people with control over or access to government resources. Most waste does not involve a violation of law; rather, waste relates primarily to mismanagement, inappropriate actions, and inadequate oversight.

Abuse is behavior that is deficient, objectively unreasonable, or improper when compared with the behavior that a prudent person would consider reasonable and necessary business practice given the facts and circumstances. Abuse also includes the misuse of authority or position for personal financial gain or the gain of an immediate or close family member or business associate. Abuse does not necessarily involve fraud or violations of laws, regulations, or provisions of a contract or grant/cooperative agreement. Examples of abuse could include making travel choices or procurement selections that are contrary to existing policies or are unnecessarily extravagant or expensive.

To minimize or even eliminate misuse of funds, the Institutes should:

- Implement well-designed and tested system of internal controls
- Conduct rigorous subrecipient monitoring
- Ensure all financial and progress reports are adequately supported with appropriate documentation and evidence
- Identify any potential conflict-of-interest issues and disclose them to DOE

- Follow a fair and transparent procurement process, especially when using consultants. Ensure the rate of pay is reasonable and justifiable, and the work product is well-defined and documented.

6. Conflict of Interest

Recipients are required to use federal funds in the best interest of their program and those decisions must be free of undisclosed personal and organizational conflicts of interest – both in appearance and fact.

Typical situations that raise a conflict of interest concern include:

- Less than arms-length-transactions: purchasing goods or services or hiring an individual from a related party such as a family member or a business associated with an employee or the recipient.
- Subgrant award decisions and contract/vendor selections must be accomplished using a fair and transparent process free of undue influence. Most procurements require full and open competition.
- Consultants can play an important role, however, their use requires a fair selection process, reasonable pay rates, and specific verifiable work product. The use of non-specific or unclear use of consultants may present as a red flag for fraud, waste or abuse.

APPENDIX F – CONFERENCE SPENDING FOR THE INSTITUTE

This appendix provides the requirements the Institute must following with regard to conference spending directly and programmatically related to the purpose of an award issued under this FOA.

A. General. The recipient, and any subrecipient at any tier, must comply with all applicable laws, regulations, policies, and DOE guidance (including specific cost limits, prior approval and reporting requirements, where applicable) governing the use of project funds for expenses related to conferences (as that term is defined by DOE), including the provision of food and/or beverages at such conferences, and costs of attendance at such conferences.

B. Definition. Conference is defined broadly to include meetings, retreats, seminars, symposia, events, and group training activity. A conference typically is a prearranged formal event with at least some of the following characteristics: designated participants and/or registration; a published substantive agenda; and scheduled speakers or discussion panels on a particular topic.

C. Prior Approval. The recipient must obtain prior approval from the DOE Contracting Officer where the conference costs are $50,000 or more. Conference costs mean all costs using project funds associated with planning, hosting, sponsoring, or otherwise holding any conference, including all of the categories of costs listed below:

- Conference meeting space (including rooms for breakout sessions);
- Audio-visual equipment and services;
- Printing and distribution;
- Meals provided at the event (generally unallowable);
- Refreshments (generally unallowable);
- Meals and incidental expenses (M&IE portion of per diem);
- Lodging;
- Air travel to/from conference;
- Local transportation (e.g., rental car, privately owned vehicle to-and-from-the airport, taxi);
- Logistical conference planner;
- Programmatic conference planner;
- Trainers, instructors, presenters, or facilitators;
- Other costs which must be identified individually;
- Staff time associated with planning and holding the conference; and
- Indirect costs/overhead rates applied to direct costs associated with the conference. (In accordance with negotiated agreements, all indirect costs associated with a conference must be applied to the above categories as appropriate and reported as conference costs.)

Requests for conferences costing $50,000 or more must be submitted to the DOE Contracting Officer 45 calendar days in advance of the earliest of the following:

- Start date of the conference;
- Deadline for signing conference-related contracts, or
- Obligation of funds for conference costs (except for minimal costs required to assemble and submit the approval request).

Approval Requests Submitted Less than the Required Number of Days in Advance (as noted above)—DOE Contracting Officer may, in their sole discretion, consider requests that are submitted late, but cannot assure that these requests will receive a decision in time to avoid having to cancel the conference (particularly if there are any issues that arise with specific items of cost in the request). Cancellation costs associated with conferences that are submitted for late prior approval may be determined to be unallowable costs by DOE.

No conference (regardless of the number of attendees) can proceed, nor can conference-related contracts (e.g., hotel contracts and travel arrangements/reservations) be signed, or conference implementation funding be obligated/work authorized (whether performed by cooperative agreement staff or outside staff), until the cooperative agreement recipient has obtained DOE Contracting Officer's approval in writing.

D. Trinkets (items such as hats, mugs, portfolios, t-shirts, coins, gift bags, regardless of whether they include the conference name logo) must not be purchased with project funds as giveaways for conferences.

E. The Institute must develop a conference management directive that addresses conference planning, sets reasonable cost thresholds for such events, and establishes processes to ensure such costs are reasonable and absolutely necessary. If an applicant is selected for award negotiations, the applicant must submit a conference management directive during the award negotiations phase for review and approval by EERE. The directive must be approved before an award will be made.

F. Use of DOE Logo or Seal. The Institute may not use the DOE logo or official seal without the required review and explicit approval by the authorized DOE official. Please see the following link for more information on the approval process: https://www.energy.gov/eere/communicationstandards/using-doe-logo-seal-or-identifier-non-federal-products

APPENDIX G – DEFINITION OF TECHNOLOGY READINESS LEVELS

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

APPENDIX H – LIST OF ACRONYMS

AI	Artificial Intelligence
AMO	Advanced Manufacturing Office
CESMII	Clean Energy Smart Manufacturing Innovation Institute
COI	Conflict of Interest
CVD	Coordinated Vulnerability Disclosure
DEC	Determination of Exceptional Circumstances
DOE	Department of Energy
EERE	Energy Efficiency and Renewable Energy
EWD	Education and Workforce Development
FAR	Federal Acquisition Regulation
FFATA	Federal Funding and Transparency Act of 2006
FOA	Funding Opportunity Announcement
FOIA	Freedom of Information Act
IACMI	Institute for Advanced Composites Manufacturing Innovation
ICS	Industrial Control Systems
IPMP	Intellectual Property Management Plan
MEP	Manufacturing Extension Partnership
ML	Machine Learning
NDA	Non-Disclosure Agreement
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Agency
OEM	Original Equipment Manufacturer
OMB	Office of Management and Budget
PII	Personal Identifiable Information
RAPID	Rapid Advancement in Process Intensification Deployment
R&D	Research and Development
REMADE	Reducing EMbodied-energy And Decreasing Emissions
RFP	Request for Proposal
SAM	System for Award Management
SCADA	Supervisory Control and Data Acquisition
SMEs	Small and Medium-sized Enterprises
SOPO	Statement of Project Objectives
TRL	Technology Readiness Level
UCC	Uniform Commercial Code

APPENDIX I – GLOSSARY

Applicant – The lead organization submitting an application under the FOA.

Continuation application – 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 to the DOE Technology Manager/Project Officer and the DOE Award Administrator its continuation application, which includes the following information:

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

Cooperative Research and Development Agreement (CRADA) – 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.

Federally Funded Research and Development Centers (FFRDC) - FFRDCs are public-private partnerships which conduct research for the United States Government. A listing of FFRDCs can be found at http://www.nsf.gov/statistics/ffrdclist/.

Go/No-Go Decision Points: –

Project-Wide Go/No-Go Decision Point - a decision point at the end of a budget period that defines the overall objectives, milestones and deliverables to be achieved by the Institute in that budget period. As of a result of EERE's review, EERE may take one of the following actions for the Institute: 1) authorize federal funding for the next budget period; 2) recommend redirection of work; 3) discontinue providing federal funding beyond the current budget period; or 4) place a hold on federal funding pending further supporting data.
Individual Institute Activity-level Go/No-Go Decision Point - a decision point at the end of a budget period that defines the objectives, milestones and deliverables to be achieved by an individual project activity within the Institute in that budget period. As of a result of EERE's review, EERE may take one of the following actions for the individual activity: 1) authorize federal funding for the next budget period; 2) recommend redirection of work; 3) discontinue providing

federal funding beyond the current budget period; or 4) place a hold on federal funding pending further supporting data.

Institute – a consortium that functions as a coordinated cohesive Clean Energy Manufacturing Institute in the area of Cybersecurity in Energy Efficient Manufacturing. An Institute includes the consortium of organizations that join up together as part of an application under this FOA and are selected for award negotiations.

Institute Activity – The scope associated with a specific R&D, modeling or analysis activity/work contained in the recipient's Statement of Project Objectives.

Institute member – an organization (e.g., FFRDC, university, industry, manufacturers, non-profit) that is a part of an application under the FOA or joins later.

Project – The entire scope of the cooperative agreement which is contained in the recipient's Statement of Project Objectives.

Recipient or "prime recipient"– A non-Federal entity that receives a federal award directly from a federal awarding agency to carry out an activity under a federal program. The term recipient does not include subrecipients.

Subrecipient – A non-federal entity that receives a subaward from a pass-through entity to carry out part of a federal program; but does not include an individual that is a beneficiary of such program. A subrecipient may also be a recipient of other federal awards directly from a federal awarding agency. Also, a DOE/NNSA and non-DOE/NNSA FFRDC may be proposed as a subrecipient on another entity's application. See section III.E.ii.

Supply Chain Network - All actors (companies, organizations) involved in moving materials and products between facilities or sharing information regarding the relevant materials and processes involved in manufacturing a specific technology or class of products.