U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Clean Energy Manufacturing Innovation Institute: Cybersecurity in Energy Efficient Manufacturing

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FOA Webinar

DE-FOA-0001960

April 16, 2019

Advanced Manufacturing Office (AMO)

The Advanced Manufacturing Office is the only technology development office within the U.S. Government that is dedicated to improving the energy and material efficiency, productivity, and competitiveness of manufacturers across the industrial sector.

VISION: U.S. global leadership in sustainable and efficient manufacturing for a growing and competitive economy.

MISSION: Catalyze research, development and adoption of energy-related advanced manufacturing technologies and practices to drive U.S. economic competitiveness and energy productivity.

Advanced Manufacturing Office (AMO)

Organizationally, AMO pursues its goals through three subprograms:

R&D PROJECTS: Bridging the innovation gap

- Supports innovative advanced manufacturing applied R&D projects
- Invests in foundational energy-related advanced manufacturing technologies

R&D CONSORTIA: Public-Private consortia model

- Brings together manufacturers, suppliers, companies, institutions of higher education, national laboratories, and state and local governments in public-private R&D consortia
- Partnerships create an innovation ecosystem that accelerates technology development

TECHNICAL PARTNERSHIPS: Direct engagement with Industry

- Provides critical support to the adoption of advanced energy efficiency technologies and practices
- Supports the adoption of cost-effective combined heat and power (CHP) technologies; provides resources to assist manufacturers; and other targeted efforts

Office of Cybersecurity, Energy Security, and Emergency Response

- The Office of Cybersecurity, Energy Security, and Emergency Response (CESER) leads the Department of Energy's (DOE's) efforts to secure our Nation's energy infrastructure against all hazards, reduce the risks of and impacts from cyber and other disruptive events, and assist with restoration activities.
- CESER's priorities are aligned with the Administration's National Cyber Strategy, and are informed by DOE's Multiyear Plan for Energy Sector Cybersecurity. These priorities include:
  - Strengthening energy sector cybersecurity preparedness
  - Accelerating the research, development, and demonstration of resilient energy delivery systems
  - Coordinating cyber incident response and recovery by working closely with local, state, and Federal agency partners, as well as industry partners.
- For more information, go to: https://www.energy.gov/ceser/office-cybersecurity-energy-security-and-emergency-response

Notice

- NO NEW INFORMATION OTHER THAN THAT PROVIDED IN THE FOA WILL BE DISCUSSED IN THE WEBINAR.

- There are no particular advantages or disadvantages to the application evaluation process with respect to participating on the webinar today.

- Your participation is completely voluntary.

Notice

- All applicants are strongly encouraged to carefully read the Funding Opportunity Announcement DE-FOA-0001960 **("FOA")** and adhere to the stated submission requirements.
- This presentation summarizes the contents of FOA. If there are any inconsistencies between the FOA and this presentation or statements from DOE personnel, the FOA is the controlling document and applicants should rely on the FOA language and seek clarification from EERE at cemii@ee.doe.gov.

DE-FOA-0001960 Clean Energy Manufacturing Innovation Institute: Cybersecurity in Energy Efficient Manufacturing

Anticipated Schedule:

FOA Issue Date:	March 26, 2019
Submission Deadline for Concept Papers:	May 15, 2019
Submission Deadline for Full Applications:	August 20, 2019
Submission Deadline for Replies to Reviewer Comments:	September 26, 2019
Expected Date for EERE Selection Notifications:	December 2019
Expected Timeframe for Award Negotiations:	120 days

Agenda

1) FOA Description
2) Topic Areas
3) Award Information
4) Statement of Substantial Involvement
5) Cost Sharing
6) FOA Timeline
7) Concept Papers
8) Full Applications
9) Merit Review and Selection Process
10) Pre-Selection Interviews
11) Registration Requirements

FOA Description

- Establishment of a Clean Energy Manufacturing Innovation Institute dedicated to advancing cybersecurity in energy efficient manufacturing
- DOE's Office of Energy Efficiency and Renewable Energy (EERE) and Office of Cybersecurity, Energy Security and Emergency Response (CESER) will be partnering on this Institute
- Targeted research and development (R&D) focusing on understanding the evolving cybersecurity threats to greater energy efficiency in manufacturing industries, developing new cybersecurity technologies and methods
- Sharing information and knowledge to the broader community of U.S. manufacturers
- Leverage wide array of expertise from industry, academia, state and local governments, Non-Governmental Organizations (NGOs), non-profits and Federally Funded Research and Development Centers (FFRDCs)

FOA Description-Institute Purpose

- 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
- 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

FOA Description-Technology Space

- Manufacturing consumes 25% of energy use in U.S.
- One critical path to improving energy efficiency is implementation of advanced automation and control.
- Such improvements can be applied in all manufacturing sectors, particularly the clean energy sector.
- Advanced approaches increase exposure to cybersecurity risks.
- Sharing newly discovered vulnerabilities and mitigations timely is key to cybersecurity.
- New workforce skillset training needs must be addressed.
- DOE identified two major priority challenge areas where collaborative R&D can assist U.S. manufacturers remain resilient against attacks and competitive in global markets:
  - Securing Automation
  - Securing the Supply Chain Network.

FOA Description-Securing Automation Challenges

- 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
  - Furthering technical innovations to develop the next-generation of secure, open control systems and interfaces.

FOA Description-Securing Automation Innovation

- 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
  - Coordinated Vulnerability Disclosure (CVD) capabilities to improve the safety and security of the advanced manufacturing and energy intensive industries.

FOA Description-Securing the Supply Chain Network Challenges

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

FOA Description-Securing the Supply Chain Network Innovation

- 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
  - Security related supply chain network efficiency.

FOA Description-Institutes

- 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
  - Transition to a privately funded model approximately 5 years after launch (also referred to as “self-sustaining”).
- Institute model provides for shared infrastructure and capabilities.
- Institutes enable development, validation, and verification of advanced manufacturing technologies while addressing key technical and engineering challenges for U.S. manufacturing.

FOA Description-Performance Metrics and Goals

- Development of technologies that result in energy efficiency gains of 15% or more in manufacturing processes through secure process automation
- 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
- 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
- Number of trained workforce (college/university, graduate school, community colleges, industry)
- Number of certified coursework/curriculums developed
- Be financially self-sustaining at the end of the 5 year federal award project period

Topic Areas

- Applications must that addresses both of the topic areas:
  - **1) Securing Automation, and**
  - **2) Securing the Supply Chain Network.**
- Only one applicant with the greatest likelihood of achieving the goals of the FOA will be selected.
- 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.

Topic Area 1) Securing Automation

- 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
  - Developing countermeasures to emerging technologies being leveraged by adversaries across all sectors
  - Designing and developing advanced manufacturing technologies that include robust cybersecurity from the ground up.

Topic Area 1) Securing Automation

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
- Improving the security of advanced analytics based on industry driven open reference architectures, standards and protocols
- Designing and implementing new secure control systems and integration of related hardware and software
- Developing an industry driven cybersecurity and resiliency framework for network-centric manufacturing
- Developing and implementing data privacy, encryption and standards for manufacturing process planning and information exchange.

Topic Area 1) Securing Automation

In addition to other critical areas identified by applicants, the Institute must focus on:

- Automation related threat identification, alerts and mitigation
- Knowledge bases focused on cyber vulnerabilities and detection of intrusions to common manufacturing systems
- Advanced behavioral anomaly detection for designing and manufacturing
- CVD guidelines, standards and education must be developed, at a minimum.

Topic Area 2) Securing Supply Chain Networks

- R&D must consider all aspects of the manufacturing supply chain network for equipment, tools, and materials.
- Recent advances in modeling and simulation, machine learning, and AI can be leveraged to improve energy efficiency and performance 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
  - Improving equipment maintenance through secure status monitoring
  - 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).

Topic Area 2) Securing Supply Chain Networks

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
- Developing and implementing approaches for testing the cybersecurity framework to address the supply network risks and resiliency
- Simulating and testing strategies should be developed and piloted to manage cybersecurity updates and maintenance, to minimize their negative impacts on productivity and profitability
- Creating shared research facilities focused on supply chain network cyber vulnerabilities discovery, detection, disclosure, and mitigation.

Education and Workforce Development (EWD)

EWD must be considered alongside the technical efforts for both topic areas 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
- New learning programs and accessible learning facilities on secure and efficient manufacturing.

Development of a Roadmap

- Initial proposed R&D, modeling, and analysis activities will be further informed by the Institute's roadmapping activities.
- Roadmap must be refined or developed during the Institute's first year, (Budget Period 1) to identify and prioritize the highest impact areas.
- Applicants must include their vision for the development of a Roadmap in the application.
- Specific R&D, modeling and analysis activities and technical targets that align with the Roadmap priorities will be negotiated with DOE into Budget Periods 2-5.
- Consistent process to compete and select projects (e.g., Request for Proposal (RFP) process) must be developed. NOTE: Projects selected under that process are subject to DOE approval.

Governance Structure and Membership Agreement

- Institute must have a clearly defined governance structure and a written set of Institute policies.
- 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.
- 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.
- Each applicant must submit a draft membership agreement.
- Membership agreement must be final before an award is issued.

Expected Institute Activities

- All work under EERE funding agreements must be performed in the United States.
- Applicants must propose work to address the primary focus of the Institute within the 2 topic areas, including EWD work for both.
- Applicants may propose to address additional application areas and other cybersecurity issues in manufacturing but must justify the benefit of this additional work.
- Clear milestones, approach to demonstrate progress towards the defined targets, and a path to achieve the long term goals must all be addressed.
- Milestones and targets must be supported by credible analysis.
- Applicants are strongly encouraged to have end users/OEMs from the relevant industries included in the Institute.
- Institute leadership team must be primarily focused on the operation and management of the proposed Institute.

Required Actions Prior to Award

Before DOE can issue an award under this FOA, the following agreements, plans, and procedures must be completed and in place:

- U.S. Manufacturing Plan updated from original application submission if required
- Data Management Plan updated from original application submission if required
- Updated conflict of interest (COI) disclosure statement (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
- Governance documents (e.g., bylaws)
- Membership Agreement
- Cybersecurity Plan updated from original application submission
- Foreign Entity Participation Plan
- IP Management Plan updated from original application submission
- Non disclosure agreement that the Institute members must all agree to
- Export Control Management Plan for the Institute
- Conference Management Directive
- Operations Plan to include project management plan, risk management plan, and project selection plan.

Expected Institute Activities During Budget Period 1

- Budget Period 1 is expected to be 12 months.
- Roadmap and startup activities during the first Budget Period:
  - 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
  - Develop a continuation package with DOE for incorporating specific projects' scopes of work and budgets into the award for Budget Period 2.

Expected Institute Activities During Budget Periods 2-5

- Work in a collaborative manner on R&D priorities defined by the Roadmap and provide progress updates
- Update the Roadmap with data from activities outcomes
- Provide a detailed outline and budget estimate for the remainder of the project period (Budget Periods 2-5)
- Roadmap must track technological progress to targets, and performance metrics identified in this FOA to achieve the outlined Institute goals
- DOE will use this information to assess how the Institute should adjust R&D priorities

DOE and the Institute will work together to maintain a single Roadmap for the Institute. All work under the Institute must align with the Roadmap.

Teaming Partner List

- To facilitate the formation of new project teams for this FOA, a Teaming Partner List will be available on EERE Exchange at https://eere-exchange.energy.gov under FOA DE-FOA-0001960.
- Any organization that would like to be included on this list should submit the following information to cemii@ee.doe.gov :
  - Organization Name, Contact Name, Contact Address, Contact Email, Contact Phone, Organization Type, Area of Technical Expertise, and Brief Description of Capabilities.
- By submitting this information, you consent 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.

Non-Responsive Applications

The following types of applications will be deemed nonresponsive and will not be reviewed or considered for an award:

- Applications that fall outside the technical parameters specified in Section I.A or I.B of the FOA
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the law 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.

Award Information

Total Amount to be Awarded	Approximately $70,000,000*
Types of Funding Agreements	• Cooperative Agreements • Funding Agreements with FFRDCs
Period of Performance	Up to 60 months in length; multiple budget periods
Cost Share Requirement	20% of Total Project Costs

*Subject to the availability of appropriated funds

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

Further details on DOE's substantial involvement can be found in Section VI.B.ix. of the FOA.

Cost Sharing Requirements

- 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).

- 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.

Cost Share Contributions

- Contributions must be:
  - Specified in the project budget
  - Verifiable from the Prime Recipient's records
  - Necessary and reasonable for proper and efficient accomplishment of the project.
- If you are selected for award negotiations, 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.
- Please note, vendors/contractors may NOT provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

Allowable Cost Share

- Cost Share must be allowable and must be verifiable upon submission of the Full Application
- Refer to the following applicable Federal cost principles:

Entity	Cost Principles
For-profit entities	FAR Part 31 *http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/31.htm*
All other non-federal entities	2 CFR Part 200 Subpart E - Cost Principles *https://www.ecfr.gov/cgi-bin/text-idx?node=2:1.1.2.2.1.5&rgn=div6*

Allowable Cost Share

- Cash Contributions
  - May be provided by the Prime Recipient, Subrecipients, or a Third Party (may not be provided by vendors/contractors)

- In-Kind Contributions
  - Can include, but are not limited to: the donation of volunteer time or the donation of space or use of equipment.

For more information, see the Cost Share Appendix in the FOA

Unallowable Cost Share

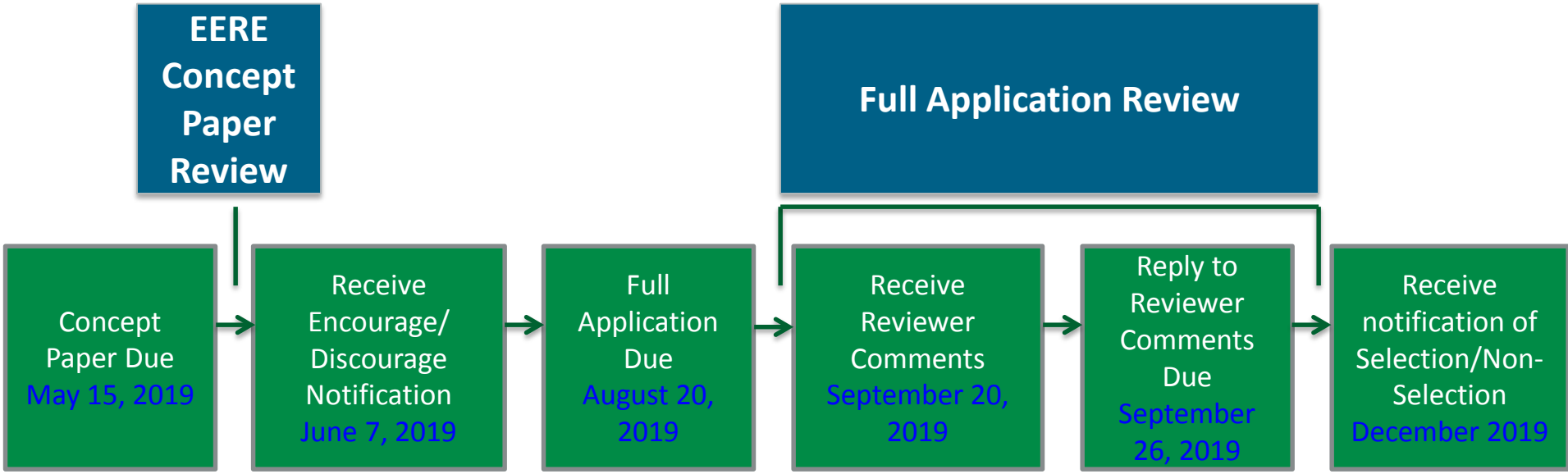
The Prime Recipient may **NOT** use the following sources to meet its cost share obligations including, but not limited to:

- 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
- Expenditures reimbursed under a separate Federal Technology Office
- The same cash or in-kind contributions for more than one project or program
- Vendor/contractor contributions
- Program income, including membership fees, earned during the period of performance (Program income must be subject to the Addition method as described in 2 CFR 200.307(e)(2)).

Cost Share Payment

- Recipients must provide documentation of the cost share contribution, incrementally over the life of the award.
- The cumulative cost share percentage provided on each invoice must reflect, at a minimum, the cost sharing percentage negotiated.
- 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. See Section III.B.vi of the FOA.

FOA Timeline



EERE anticipates making awards by March, 2020

Concept Papers

- Applicants must submit a Concept Paper.
  - Each Concept Paper must be limited to a single Institute concept.
- Section IV.C of the FOA states what information a Concept Paper should include and the page limits.
  - Failure to include the required content could result in the Concept Paper receiving a “discouraged” determination or the Concept Paper could be found to be ineligible.
- Concept Papers must be submitted by May 15, 2019, through EERE Exchange.
- EERE provides applicants with: (1) an “encouraged” or “discouraged” notification, and (2) the reviewer comments.

Concept Paper Review

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.

Concept Paper Review – cont.

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.

Full Applications

- ❑ Technical Volume
- ❑ Statement of Project Objectives
- ❑ SF-424 Application for Federal Assistance
- ❑ Budget Justification Workbook (EERE 335)
- ❑ Summary for Public Release
- ❑ Summary Slide
- ❑ Subrecipient Budget Justification (EERE 335) (if applicable)
- ❑ DOE Work Proposal for FFRDC (if applicable)
- ❑ Authorization from cognizant Contracting Officer for FFRDC (if applicable)
- ❑ Authorization from Director of Laboratory Policy (SC-32) (if applicable)
- ❑ SF-LLL: Disclosure of Lobbying Activities (required)
- ❑ Foreign Entity and Foreign Work waiver requests (if applicable)
- ❑ U.S. Manufacturing Plan
- ❑ Draft IP Management Plan
- ❑ Data Management Plan
- ❑ Conflict of Interest (COI) Disclosure Statement
- ❑ Draft Membership Agreement
- ❑ Draft Cybersecurity Plan
- ❑ Compliance Matrix

Full Applications: Technical Volume Content

Technical Volume: the key technical component of the Full Application

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.

Content of Technical Volume	Suggested % of Technical Volume
Cover Page	
Institute Overview	No more than 2 pages
Technical Description, Innovation and Impact	50%
Qualifications and Resources	20%
Operations and Management Approach	30%

Full Application Eligibility Requirements

- Applicants must submit a Full Application by August 20, 2019.
- Full Applications are eligible for review if:
  - The Applicant is an eligible entity Section III.A of the FOA
  - The Applicant submitted an eligible Concept Paper
  - The Cost Share requirement is satisfied Section III.B of the FOA
  - The Full Application is compliant Section III.C of the FOA
  - The proposed project is responsive to the FOA. See Section I and Section III.D of the FOA
  - The Applicant is compliant with the limitation on Number of Concept Papers and Full Applications eligible for review per Section III.F of the FOA.

Who is Eligible to Apply?

Eligible applicants for this FOA include:

1. U.S. citizens and lawful U.S. permanent residents
2. Domestic For-profit entities
3. Domestic Educational institutions
4. Domestic Nonprofits
5. U.S. State, local, and tribal government entities
6. DOE/NNSA FFRDCs

For more detail about eligible applicants, please see Section III.A of the FOA

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.

Prime Recipients must be in must be incorporated (or otherwise formed) under the laws of a State or territory of the United States and have a physical location for business operations in the United States. See Section III.A.iii for requirements applicable to foreign entities.

Limit on Number of Submissions

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.

Merit Review and Selection Process (Full Applications)

- The Merit Review process consists of multiple phases; each include an eligibility review and a thorough technical review
- Rigorous technical reviews are conducted by reviewers who 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, to make the selection decisions.

Full Application Technical Merit Review Criteria

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.

Full Application Technical Merit Review Criteria – Continued

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

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.

Full Application Technical Merit Review Criteria – Continued

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

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.

Full Application Technical Merit Review Criteria – Continued

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.

Full Application Technical Merit Review Criteria – Continued

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).

Full Application Technical Merit Review Criteria – Continued

Criterion 3: Operations and Management (25%), continued:

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.

Full Application Technical Merit Review Criteria – Continued

Criterion 3: Operations and Management (25%), continued:

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.

Replies to Reviewer Comments

- EERE provides applicants with reviewer comments.
- Applicants are not required to submit a Reply - it is optional.
- To be considered by EERE, a Reply must be submitted by September 26, 2019, and submitted through EERE Exchange.
- Content and form requirements:

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.

Pre-Selection Interviews

- EERE may invite one or more applicants to participate in Pre-Selection Interviews.
- All interviews will be conducted in the same format.
- 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.
- Participation in Pre-Selection Interviews with EERE does not signify that applicants have been selected for award negotiations.

Selection Factors

The Selection Official may consider:

- Merit review recommendation
- Program policy factors
- Amount of funds available in arriving at selections for this FOA.

Program Policy Factors

The Selection Official may consider the following program policy factors in making his/her selection decisions:

- 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
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications).

Registration Requirements

- To apply to this FOA, Applicants must register with and submit application materials through EERE Exchange: https://eere-Exchange.energy.gov
- Obtain a "control number" at least 24 hours before the first submission deadline at https://eere-Exchange.energy.gov
- Although not required to submit an Application, the following registrations must be complete to received an award under this FOA:

Registration Requirement	Website
DUNS Number	http://fedgov.dnb.com/webform
SAM	https://www.sam.gov
FedConnect	https://www.fedconnect.net
Grants.gov	http://www.grants.gov

Means of Submission

- Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted through EERE Exchange at https://eere-Exchange.energy.gov
- **EERE will not review or consider applications submitted through other means**
- The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements can be found at https://eere-Exchange.energy.gov/Manuals.aspx

Key Submission Points

- Check entries in EERE Exchange
  - Submissions could be deemed ineligible due to an incorrect entry
- EERE strongly encourages Applicants to submit 1-2 days prior to the deadline to allow for full upload of application documents and to avoid any potential technical glitches with EERE Exchange
- Make sure you hit the submit button
  - Any changes made after you hit submit will un-submit your application and you will need to hit the submit button again
- For your records, print out the EERE Exchange Confirmation page at each step, which contains the application's Control Number

Applicant Points-of-Contact

- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations
- It is imperative that the Applicant/Selectee be responsive during award negotiations and meet negotiation deadlines
  - Failure to do so may result in cancellation of further award negotiations and rescission of the Selection

Questions

- Questions about this FOA? Email cemii@ee.doe.gov
  - All Q&As related to this FOA will be posted on EERE Exchange
  - You must select this specific FOA Number in order to view Q&As
  - EERE will attempt to respond to a question within 3 business days, unless a similar Q&A is already posted on the website
- Problems logging into EERE Exchange or uploading and submitting application documents with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov
  - Include FOA name and number in subject line
- All questions asked during this presentation will be posted on EERE Exchange