

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U. S. Department of Energy  
National Energy Technology Laboratory**

**Funding Opportunity Number: DE-FOA-0001441**

**“Industry Partnerships for Cybersecurity of Energy Delivery Systems (CEDS)  
Research, Development and Demonstration for the Energy Sector”**

**Announcement Type: Initial**

**CFDA Number: 81.122, Electricity Delivery and Energy Reliability, Research,  
Development and Analysis**

<b>Issue Date:</b>	<b>01/20/2016</b>
<b>Letter of Intent Due Date:</b>	<b>Not Applicable</b>
<b>Pre-Application Due Date:</b>	<b>Not Applicable</b>
<b>Application Due Date:</b>	<b>03/21/2016 at 3:00:00 PM Eastern Time</b>

*This Funding Opportunity Announcement (FOA) will remain open until the Application Due Date indicated above; however, applications may be submitted any time before this date.*

*It is strongly recommended that application submission begin well in advance (at least 48 hours) of the Application Due Date. ALL applications in response to this FOA must be submitted through Grants.gov.*

## **NOTE: REGISTRATION/SUBMISSION REQUIREMENTS**

### **Registration Requirements**

There are several one-time actions you must complete in order to submit an application in response to this FOA (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the System for Award Management (SAM) and register with Grants.gov).

Applicants who are not registered with SAM and Grants.gov, should allow at least 44 days to complete these requirements. It is suggested that the process be started as soon as possible.

**Applicants must obtain a DUNS number. DUNS website:**

<http://fedgov.dnb.com/webform>

**Applicants must register with SAM. SAM website:** <http://www.sam.gov/>. If you had an active registration in CCR, you should have an active registration in SAM. More information about SAM registration for applicants is found at:

[https://www.sam.gov/sam/transcript/Quick\\_Guide\\_for\\_Grants\\_Registrations\\_v1.7.pdf](https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations_v1.7.pdf).

**Applicants must register with Grants.gov. Grants.gov website:** <http://www.grants.gov/>

There are 3 steps to this process.

- 1) The Authorized Organizational Representative (AOR) must register at:  
<https://apply07.grants.gov/apply/OrcRegister>.
- 2) An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their MPIN from their SAM registration.
- 3) AOR verifies that registration was completed at:  
[http://grants.gov/applicants/applicant\\_profile.jsp](http://grants.gov/applicants/applicant_profile.jsp).

More information about the above steps is provided at:

[http://www.grants.gov/applicants/organization\\_registration.jsp](http://www.grants.gov/applicants/organization_registration.jsp).

**Applicants must register with FedConnect to submit questions. FedConnect website:**

[www.fedconnect.net](http://www.fedconnect.net)

### **Questions**

Questions relating to the **system requirements or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

Questions regarding the **content** of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. The U.S. Department of Energy will try to respond to a question within three (3) business days, unless a similar question and answer have already been posted on the website.

### **Application Preparation and Submission**

**Applicants must download the application package, application forms and instructions from Grants.gov. Grants.gov website: <http://www.grants.gov/>**  
(Additional instructions are provided in Section IV.A. of this FOA.)

#### **Where to Submit**

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your SAM registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

**IMPORTANT NOTICE TO POTENTIAL APPLICANTS:** When you have completed the registration process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

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## **Section I - FUNDING OPPORTUNITY DESCRIPTION**

### **A. SUMMARY**

The Department of Energy's (DOE's) National Energy Technology Laboratory (NETL) on behalf of the Office of Electricity Delivery and Energy Reliability (OE) is seeking applications under this Funding Opportunity Announcement (FOA), herein referred to as Announcement, to conduct research, development and demonstrations (RD&D). This RD&D will lead to next generation tools and technologies that will become widely adopted to enhance and accelerate deployment of cybersecurity capabilities for the U.S energy infrastructure, including cyber secure integration of smart grid technologies.

### **B. BACKGROUND INFORMATION**

The Cybersecurity for Energy Delivery Systems Program (CEDS) within the Power Systems Engineering Research and Development (PSE R&D) Division of the Office of Electricity Delivery and Energy Reliability (OE) is conducting this Announcement seeking innovative cybersecurity defense approaches for the energy sector. The CEDS program has established partnerships over the past several years throughout the energy sector, government, national laboratories and universities to reduce the risk of energy delivery disruption resulting from a cyber event.

The CEDS program desires to advance cybersecurity technology that aligns with the strategic framework of the Roadmap to Achieve Energy Delivery Systems Cybersecurity <sup>1</sup>, herein referred to as Roadmap. The DOE's Office of Electricity Delivery and Energy Reliability, in collaboration with the U.S. Department of Homeland Security's Science and Technology Directorate and Energy Sector Control Systems Working Group (ESCSWG) in support of the Electricity Sub-sector Coordinating Council, Oil and Natural Gas Sector Coordinating Council, and the Government Coordinating Council for Energy under the Critical Infrastructure Partnership Advisory Council (CIPAC) Framework, facilitated the development of the Roadmap. The Roadmap synthesizes expert input from the energy delivery control systems community, including owners and operators, commercial vendors, national laboratories, industry associations, and government agencies. The Roadmap presents a strategic framework supported by key milestones that once met will achieve the Roadmap vision that by 2020 resilient energy delivery systems are designed, installed, operated and maintained to survive a cyber-incident while sustaining critical functions.

### **C. STATUTORY AUTHORITY**

The statutory authority for the CEDS program is provided by Public Law 19-58 [Energy Policy Act (EPAc) 2005].

### **D. FUNDING OPPORTUNITY DESCRIPTION**

The objective of this Announcement is to enhance the reliability and resilience of the nation's energy infrastructure through innovative RD&D cybersecurity solutions. This includes electricity generation, transmission and distribution as well as the production, refining, storage

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<sup>1</sup> ([www.controlsystemsroadmap.net](http://www.controlsystemsroadmap.net))

and distribution of oil and gas in accordance with DOE's energy infrastructure role defined in Homeland Security Presidential Directive (HSPD) 7. Solutions should be interoperable, scalable, cost-effective advanced technologies and techniques that do not impede critical energy delivery functions, that are innovative and that implement common methods and best practices.

## **E. TOPIC AREAS**

This Announcement includes five (5) Topic Areas. **Only applications that specifically address Topic Areas described in the following section will be accepted under this Announcement.**

Topic Area 1 – Detect Adversarial Manipulation of Energy Delivery Systems Components

Topic Area 2 – Secure Integration of Renewable Energy and Energy Efficiency Resources

Topic Area 3 – Continual and Autonomous Reduction of Cyber Attack Surface for Energy Delivery Control Systems

Topic Area 4 – Supply Chain Cybersecurity for Energy Delivery Systems

Topic Area 5 – Innovative Technologies That Enhance Cybersecurity in the Energy Sector

### **Topic Area 1 – Detect Adversarial Manipulation of Energy Delivery Systems Components**

Research, develop and demonstrate technology or techniques to detect and respond, as appropriate, to adversarial cyber activity that seeks to evade detection by exploiting expected and allowed operations of energy delivery systems. For example, malicious manipulation of energy sector communications may use an expected protocol and request an action that local devices were designed to perform but that action may be undesired in the larger operational context. The technology or techniques must not impede critical energy delivery functions and must be demonstrated to validate a clear industry acceptance.

### **Topic Area 2 – Secure Integration of Renewable Energy and Energy Efficiency Resources**

Research, develop and demonstrate technology or techniques that strengthen cybersecurity for the integration of renewable energy or energy efficiency resources at one or more of the generation, transmission or distribution levels. This could include but is not limited to the cybersecurity for the integration of solar, wind, energy storage systems, and the interaction of building control systems or plug-in hybrid vehicles with the power grid. The technology or techniques must not impede critical energy delivery functions and must be demonstrated to validate a clear industry acceptance.

### **Topic Area 3 – Continual and Autonomous Reduction of Cyber Attack Surface for Energy Delivery Control Systems**

Research, develop and demonstrate technology or techniques that continually and autonomously reduce the cyber-attack surface of energy delivery control systems or components, at one or more of the hardware, firmware or software levels. The technology should be manageable by the asset owner, allowing the asset owner to continually know the cybersecurity state of the energy delivery control systems or components. The technology or techniques must not impede critical energy delivery functions and must be demonstrated to validate a clear industry acceptance.

### **Topic Area 4 – Supply Chain Cybersecurity for Energy Delivery Systems**

Research, develop and demonstrate technology or techniques to detect energy delivery control systems or components that have been subjected to malicious compromise with the intent to cause the energy delivery control system to not function as intended, at any stage in the supply chain. The research can include but is not limited to detecting malicious compromise of the integrated control system, or one or more of its hardware, firmware or software components. The technologies and techniques may include the capability for continuous detection during operation at the energy asset end-user installation. The technology or techniques must not impede critical energy delivery functions and must be demonstrated to validate a clear industry acceptance.

### **Topic Area 5 – Innovative Technologies that Enhance Cybersecurity in the Energy Sector**

The Roadmap to Achieve Energy Delivery Systems Cybersecurity provides a strategic framework that directs research and development of cybersecurity solutions for the energy sector, including both sub-sectors: electricity and oil and natural gas. This topic area requests a proposal that identifies, and proposes a technical solution to address, a research gap that, if addressed, could enhance coverage of the energy sector’s Roadmap goals, for one or both energy subsectors. Alignment of the identified research gap, and its proposed innovative solution, with the Roadmap goals must be clearly articulated. Proposals for this category must be innovative technical solutions. The technology or techniques must not impede critical energy delivery functions and must be demonstrated to validate a clear industry acceptance.

## **F. APPLICATION REQUIREMENTS**

Applicants should prepare and submit applications as follows:

- Applicants may submit more than one application; however, the Applicant must target only one Topic Area per application.
- Applicants must clearly identify the Topic Area they are applying to in the Project Narrative.
- Detailed instructions on naming the Project Narrative file are provided in section IV-C.

Applicants must submit their application under the Topic Area that they feel best fits the majority of the effort to be performed, and the application must clearly identify the Topic Area being addressed. If the DOE believes an application fits more appropriately in a Topic Area other than the one to which it was submitted, DOE may evaluate the application under the more appropriate Topic Area. Do not submit identical applications under more than one Topic Area.

Each application submitted in response to this funding opportunity announcement must include phases/tasks for research and development (R&D), as well as demonstration of the proposed technology under a real-world situation. **As such, the inclusion of both a commercialization entity and an energy asset owner/operator in the applicant team is *highly encouraged*.** Applications must consist of R&D, and demonstration aspects of the proposed technology. Applicants who fail to address both the R&D and demonstration aspects of the proposed technology will not be considered for award. **NOTE:** Applicants may propose a project that consists only of the demonstration phase; however, such applications must thoroughly describe the research and development that has already been conducted on the proposed technology and



provide evidence that the proposed technology is sufficiently developed for demonstration.

Cooperative Agreements that result from this FOA will be structured to include the R&D effort and the demonstration as separate Phases, or will include a go/no-go decision point prior to initiation of the demonstration phase. As such, applications should be prepared so that R&D and demonstration tasks (along with associated budget estimates) are segregated and can be readily identified. Moreover, since cost share requirements differ for R&D and demonstration projects, the ability to distinguish between R&D and demonstration work will result in a more accurate determination of overall project cost share.

Transition of the proposed technology for use within the energy sector, through commercialization and/or open source availability is a program expectation.

## Section II - AWARD INFORMATION

### **A. TYPE OF AWARD INSTRUMENT**

**Cooperative Agreements:** DOE anticipates awarding cooperative agreements under this Announcement (See Section VI.B.2 Statement of Substantial Involvement).

### **B. ESTIMATED FUNDING**

Approximately \$23,000,000 is expected to be available for new awards under this announcement. Funding for all awards is contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

### **C. MAXIMUM AND MINIMUM AWARD SIZE**

Ceiling (i.e. the maximum amount of DOE contribution for an individual award made under this announcement): \$4,000,000

Floor (i.e. the minimum amount for an individual award made under this announcement): None

### **D. EXPECTED NUMBER OF AWARDS**

DOE anticipates making between 5 and 10 awards under this announcement depending on the size of the awards.

### **E. ANTICIPATED AWARD SIZE**

While the maximum award size (i.e. the ceiling) is \$4,000,000, not including cost share, DOE anticipates that the majority of the awards will be in the \$2,000,000 to \$3,000,000 range, not including cost share, for the total project period.

### **F. PERIOD OF PERFORMANCE**

DOE anticipates making awards with an estimated project period of up to three (3) years.

### **G. TYPE OF APPLICATION**

DOE will accept only new applications under this announcement.

## Section III - ELIGIBILITY INFORMATION

### **A. ELIGIBLE APPLICANTS**

#### **1. Domestic Entities**

For-profit entities, educational institutions, and nonprofits that are incorporated (or otherwise formed) under the laws of a particular state or territory of the United States are eligible to apply for funding as a prime recipient or subrecipient.

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) and DOE Government-Operated Government-Owned laboratories (GOGOs) are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient.

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

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

**NOTE:** NETL is not considered eligible for award under this announcement and may not be proposed as a team member on another entity's application.

#### **2. Incorporated Consortia**

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a prime recipient or subrecipient. For consortia incorporated (or otherwise formed) under the laws of a state or territory of the United States, please refer to "Domestic Entities" above. For consortia incorporated in foreign countries, 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 Contracting Officer.

#### **3. Unincorporated Consortia**

Unincorporated consortia, which may include domestic and foreign entities, must designate one member of the consortium to serve as the prime recipient/consortium representative. The prime recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a state or territory of the United States. The eligibility of the consortium will be determined by the eligibility of the prime recipient/consortium representative under Section III.A of the FOA.

Upon request, unincorporated consortia must provide the DOE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should 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 phase(s) of projects and 50% of the total allowable costs for demonstration and commercial application phase(s) of projects and must come from non-Federal sources unless otherwise allowed by law. The sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project. (See 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation] for the applicable cost sharing requirements.)

**NOTE: Applications should be prepared so that R&D and demonstration tasks (along with associated budget estimates, including cost share) can be readily identified.**

## **C. OTHER ELIGIBILITY REQUIREMENTS**

### **FFRDC/National Laboratories**

Federally Funded Research and Development Center (FFRDC) Contractors. FFRDC contractors may be proposed as a team member on another entity's application subject to the following guidelines:

**Authorization for non-DOE/NNSA FFRDCs.** The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

**Authorization for DOE/NNSA FFRDCs.** The cognizant contracting officer for the FFRDC must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

*"Authorization is granted for the [Name] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."*

**Cost Share.** The applicant's cost share requirement will be based on the total cost of the project, which includes the DOE share, the applicant's share and the FFRDC contractor's portion of the effort.

**FFRDC Contractor Effort.** The FFRDC contractor effort, in aggregate, shall not exceed ten percent (10%) of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

**Responsibility.** The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

#### **D. PERFORMANCE OF WORK IN THE UNITED STATES**

The Recipient agrees that 100 percent of the direct labor cost for the project (including subrecipient labor) shall be incurred in the United States, unless the Recipient can demonstrate to the satisfaction of the Department of Energy that the United States economic interest will be better served through a greater percentage of the work being performed outside of the United States.

Applicants and prime recipients may request a waiver of this requirement. Applicants must include a written waiver request in the Full Application. Prime recipients must submit any waiver requests in writing to the DOE Contracting Officer for this FOA. The DOE Contracting Officer has discretion to waive this requirement if he/she determines that it will further the purposes of this FOA and is otherwise in the best interest of the Government. If you would like to request a waiver see Section VIII.

## **Section IV - APPLICATION AND SUBMISSION INFORMATION**

### **A. ADDRESS TO REQUEST APPLICATION PACKAGE**

#### **Apply at Grants.gov**

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "APPLICANT", then Click "Apply for Grants," and then select "Download a Grant Application Package." Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

### **B. LETTER OF INTENT AND PRE-APPLICATION**

#### **1. Letter of Intent.**

Letters of Intent are not required.

#### **2. Pre-application.**

Pre-applications are not required.

### **C. CONTENT AND APPLICATION FORMS**

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.

#### **1. SF 424 (R&R)**

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances.

#### **2. RESEARCH AND RELATED Other Project Information**

Complete questions 1 through 6 and attach files. The files must comply with the following instructions:

##### **Project Summary/Abstract (Field 7 on the Form)**

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 (including the Topic Area), the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e. benefits, outcomes), and major participants (for collaborative projects). This document must not include

any proprietary or sensitive business information as the Department may make it available to the public after awards are made. The project summary must not exceed 2 pages when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) {single spaced} with font not smaller than 11 point. To attach a Project Summary/Abstract, click "Add Attachment."

### **Project Narrative (Field 8 on the Form)**

The project narrative must not exceed twenty-five (25) pages, including cover page (title including Topic Area), table of contents, charts, graphs, maps, photographs, tables, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) {single spaced} with font not smaller than 11 point. **EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click "Add Attachment."

The project narrative must include:

- **Project Objectives:** This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.
- **Technical Discussion:** The proposed research, development, and demonstration approach to meeting the identified Topic Area should be clearly described. Tasks for research and development of the proposed technology and a verification/demonstration test of the technology in a test bed, laboratory, or other environment that simulates a real-world situation should be specified. Applications may propose a project that consists only of the verification/demonstration test. However, such applications must thoroughly describe the research and development that has already been conducted on the proposed technology and provide evidence that the proposed technology is sufficiently developed for the test.

Commercialization and/or transition to practice plan for the proposed technology or methodology must be included. Applications must not include the development of a test bed for the verification/demonstration test. Applications that fail to address the research, development, verification/demonstration, and commercialization of the proposed technology will not be considered for award. **NOTE:** Applicants may propose a project that consists only of the demonstration phase; however, such applications must thoroughly describe the research and development that has already been conducted on the proposed technology and provide evidence that the proposed technology is sufficiently developed for demonstration.

In addition, applications should discuss how the proposed technology will meet the following general requirements:

- The cyber risk reduction that the proposed technology produces is cost-effective, that is, its cost should be commensurate with the cost of its deployment.
- The proposed technology is capable of having a significant impact on the cyber security of the energy infrastructure.
- If applicable to legacy systems, the technology is capable of being installed without measurable system down time.
- The proposed technology is capable of continuous use.
- Design of the proposed technology anticipates future trends to avoid obsolescence before the completion of the proposed technology's economic life cycle.

- The proposed technology is easily retrofitted or out-of-the-box compatible and interchangeable with a variety of different vendor network, hardware, software, and control devices.
- The proposed technology has the ability to fully protect against unauthorized authentication at all remote access points, whether wire or wireless.
- The proposed technology has a logical commercialization path that includes customer and vendor participation.

- **Merit Review Criterion Discussion:** The section should be formatted to address each of the merit review criterion and sub-criterion listed in Part V.A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. **DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.**

- **Relevance and Outcomes/Impacts:** This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.

- **Roles Of Participants:** For multi-organizational projects, describe the roles and the work to be performed by each participant, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.

- **Multiple Principal Investigators:** The applicant, whether a single organization or team/partnership/consortium, must indicate if the project will include multiple PIs. This decision is solely the responsibility of the applicant. If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a "Coordination and Management Plan" that describes the organization structure of the project as it pertains to the designation of multiple PIs. This plan should be included as an appendix and, at a minimum, include:

- process for making decisions on scientific/technical direction;
- publications;
- intellectual property issues;
- communication plans;
- procedures for resolving conflicts; and
- PIs' roles and administrative, technical, and scientific responsibilities for the project.

- **Statement Of Project Objectives (SOPO) Appendix:** The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part after award. It is therefore required that it shall not contain proprietary or confidential business information.

The Statement of Project Objectives is generally less than five (5) pages in total for the proposed work (and is not included in the 25 page limit for the project narrative file). Applicants shall prepare the Statement of Project Objectives in the following format:

**TITLE OF WORK TO BE PERFORMED** (Insert the title of work to be performed. Be concise and descriptive and please limit the title to 40 characters. Specify the Topic Area on the title page.)

#### A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

#### B. SCOPE OF WORK



This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

### C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. This section provides a brief summary of the planned approach to this project. An outline of the Project Management Plan (referenced in Task 1.0 below and required to be submitted with your application) is provided later in this Section.

#### PHASE I

##### Task 1.0 - Project Management and Planning

Subtask 1.1 - Update Project Management Plan – An updated Project Management Plan shall be submitted within 30 days of award that includes detailed planning information related to how the recipient will establish and maintain the Industry Advisory Board (IAB) and how the team will interact with the IAB in selecting projects to undertake, soliciting advice on ongoing R&D activities, and determining if an R&D activity warrants early termination due to lack of progress/results or changing industry needs. The PMP will also be updated as needed to reflect significant changes in budget, schedule, scope, or other aspect of the plan.

Subtask 1.2 - Update Data Management Plan – An updated Data Management Plan shall be submitted within 30 days of award that includes any updates since applying to the FOA (e.g., as a result of negotiations or additional project planning by the recipient’s team). The DMP will also be updated as needed to reflect significant changes to any aspect of the plan.

##### Task 2.0 – Research and Development

Task 2.1 – [Title]

Task 2.2 – [Title]

Task 3.0 – Commercialization Plan [Note: DOE intends this task to be initiated early in the project with completion occurring after the demonstration phase, if authorized.]

***Go/No-Go Decision: The recipient shall not begin the next phase until receiving written authorization from the DOE Contracting Officer (CO) to proceed. Written authorization can be in the form of email or letter issued by the CO.***

#### PHASE II

##### Task 4.0 – Field Test Demonstration

### D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist.

[Note: The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1.1 - updated Project Management Plan
2. Task 1.2 - updated Data Management Plan
3. Task 2.2 - (Report Description)
4. Task 4.x – Commercialization Plan
5. etc.....

#### E. BRIEFINGS/TECHNICAL PRESENTATIONS

The recipient must prepare detailed briefings for presentation to the Project Officer at the Project Officer's duty station in Pittsburgh, PA or Morgantown, WV. The recipient must make a presentation to the NETL Project Officer/Manager at a project kick-off meeting held within 90 days of project start date. At a minimum, annual briefings must also be given by the recipient to describe its plans, progress, and results of its technical effort. A final project briefing at the close of the project must also be given.

***\*\*\*End of the Draft Statement of Project Objectives\*\*\****

- Bibliography & References Cited Appendix: Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. Do not attach a file in Field 9. This appendix will not count in the project narrative page limitation.

- Facilities & Other Resources Appendix: This information is used to assess the capability of the organizational resources, including subrecipient resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical, and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. Do not attach a file in Field 10. This appendix will not count in the project narrative page limitation.

- Equipment Appendix: List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. Do not attach a file in Field 11. This appendix will not count in the project narrative page limitation.

- Coordination and Management Plan Appendix, if needed. See Multiple Principal Investigator section above.

Other Attachments (Field 12 on the form)

If you need to elaborate on your responses to questions 1-6 on the "Other Project Information" document, attach a file in field 12.

Also, attach the following files:

### **Project Management Plan**

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

A. **Executive Summary:** Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative (Field 8) and should be simply copied to this document for completeness, so that the Project Management Plan is a stand-alone document.

B. **Risk Management:** Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.

C. **Milestone Log:** Provide milestones for each phase of the project. Each milestone should include a title and planned completion date. Milestones should be quantitative and show progress toward project goals.

[Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Report as prescribed under Attachment 4, Reporting Requirements Checklist. The Milestone Status will present actual performance in comparison with Milestone Log, and include:

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

D. **Funding and Costing Profile:** Provide a table (the Project Funding Profile) that shows, by phase, the amount of government funding going to each project team member. Also provide a table (the Project Costing Profile) that projects, by month, the expenditure of government funds.

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

F. **Success Criteria at Decision Points:** Provide success criteria for each decision point in the project, including go/no-go decision points and the conclusions of phases and the entire project. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

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

Save this plan in a single file named "pmp.pdf" and click on "Add Attachments" in Field 12 to attach.

### **Commitment Letters from Third Parties Contributing to Cost Sharing**

If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of the required cost sharing, the applicant must include a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Save this information in a single file named "CLTP.pdf" and click on "Add Attachments" in Field 12 to attach.

**Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor, if applicable**

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, you must submit a full subaward budget (Reference Subaward Files Section below) and authorization as stated in Section III C above.

**Environmental Questionnaire**

You must complete the environmental questionnaire at [http://www.netl.doe.gov/File%20Library/Business/forms/451\\_1-1-3.pdf](http://www.netl.doe.gov/File%20Library/Business/forms/451_1-1-3.pdf). Save the questionnaire in a single file named "Env.pdf" and click on "Add Attachments" in Field 12 to attach.

**3. RESEARCH AND RELATED SENIOR/KEY PERSON**

Complete this form before the Budget form to populate data on the Budget form. Beginning with the PD/PI, provide a profile for each senior/key person proposed. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual. Subrecipients and consultants must be included if they meet this definition. For each senior/key person provide:

**Biographical Sketch.** Complete a biographical sketch for each senior/key person and attach to the "Attach Biographical Sketch" field in each profile. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

**Education and Training.** Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

**Research and Professional Experience.** Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

**Publications.** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

**Synergistic Activities.** List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support. Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subrecipients, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the "Attach Current and Pending Support" field in each profile.

#### **4. RESEARCH AND RELATED BUDGET (TOTAL FED + NON-FED)**

Complete the Research and Related Budget (Total Fed & Non-Fed) form in accordance with the instructions on the form and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See Section IV.G).

**NOTE: Budget estimates, including cost share should be prepared so that the R&D and demonstration costs can be readily identified.**

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. If cost sharing is required, provide an explanation of the source, nature, amount, and availability of any proposed cost sharing. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

Applicants shall use the Detailed Budget Justification form (OMB Number 1910-5162) provided as an attachment to this announcement and also embedded below. Save the information in a single file named "RecipientBudgetJustification.xls or.xlsx" and click on "Add Attachments" in Field K to attach.



omb1910 budget  
justification with 3 phæ

#### **5. R&R SUBAWARD (TOTAL FED + NON-FED) FORM**

Budgets for Subrecipients, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subrecipient that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET (Total Fed + Non-Fed) FORM and e-mail it to each subrecipient that is required to submit a separate budget. After the Subrecipient has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of

the subrecipient's name as the file name.

Applicants shall use the Detailed Budget Justification form (OMB Number 1910-5162) provided as an attachment to this announcement and also embedded below. Save the information in a single file named "RecipientBudgetJustification.xls or xlsx" and click on "Add Attachment" to attach.



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justification with 3 pha

## **6. PROJECT/PERFORMANCE SITE LOCATION(S)**

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

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

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

## **7. DISCLOSURE OF LOBBYING ACTIVITIES (SF-LLL)**

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

## **8. DATA MANAGEMENT PLAN**

The Data Management Plan must not exceed 6 pages when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) single spaced. **EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Part VIII.D for instructions on how to mark proprietary application information.

Applicants are required to submit a Data Management Plan with their Full Application. The Data Management Plan outlines the proposed plan for data sharing or preservation. Guidance for preparing a Data Management Plan is included in Appendix A of the FOA.

Therefore, in addition to the guidelines set forth in Appendix A, the Data Management Plan should include: (1) a description of the types of data that will be generated under this project, (2) a description of the types of data that will be made publically available, and (3) a description of any restrictions that will be placed on the data. If software is anticipated to be developed under the Award, the Data

Management Plan should also include a plan for its distribution (e.g., open source or commercial licensing).

Save this plan in a single file named "DataPlan.pdf," and click on "Add Optional Other Attachment" to attach.

## Summary of Required Forms and Files

Your application must include the following documents:

<b>Name of Document</b>	<b>Format</b>	<b>Attach to</b>
<b>SF 424 (R&amp;R)</b>	Form	N/A
<b>RESEARCH AND RELATED Other Project Information</b>	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
Budget for DOE/NNSA FFRDC, if applicable	Excel	Field 12
Project Management Plan	PDF	Field 12
Commitment Letters from Third Parties	PDF	Field 12
Environmental Questionnaire	PDF	Field 12
SF 424C Excel - Budget Information for Construction Programs File, if applicable	PDF	Field 12
<b>RESEARCH &amp; RELATED SENIOR/KEY PERSON Profile (Expanded) (Optional)</b>	Form	N/A
Biographical Sketch	PDF	Attach to appropriate block
Current and Pending Support	PDF	Attach to appropriate block
<b>RESEARCH AND RELATED BUDGET (Total Fed + Non-Fed)</b>	Form	N/A
Budget Justification	Excel	Field K
<b>R&amp;R SUBAWARD BUDGET (Total Fed + Non-Fed) ATTACHMENT(S) FORM, if applicable</b>	Form	N/A
Subaward Budget Justification	Excel	Field K
<b>PROJECT/PERFORMANCE SITE LOCATION(S)</b>	Form	N/A
<b>SF-LLL Disclosure of Lobbying Activities, if applicable</b>	Form	N/A
<b>DATA MANAGEMENT PLAN</b>	PDF	Add optional other attachment

## **D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS**

If selected for award, DOE/NNSA 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
- 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

## **E. SUBMISSION DATES AND TIMES**

### **1. Pre-application Due Date**

Pre-applications are not required.

### **2. Application Due Date**

Applications must be received by 3/21/2016, not later than 3:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. **APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

## **F. INTERGOVERNMENTAL REVIEW**

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

## **G. FUNDING RESTRICTIONS (December 2014)**

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

**Cost Principles.** Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation]. The cost principles for commercial organizations are in FAR Part 31.

**Pre-award Costs.** Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation]. Recipients must obtain the prior approval of the Contracting Officer for any pre-award costs that are for periods greater than this 90 day calendar period.

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



## **H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS**

### **1. Where to Submit**

#### **APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD.**

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

### **2. Registration Process**

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See [http://www.grants.gov/applicants/get\\_registered.jsp](http://www.grants.gov/applicants/get_registered.jsp)). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. See the Grants.gov web page for Registering as an Organization at <http://www.grants.gov/web/grants/applicants/organization-registration.html> to guide you through the process. [IMPORTANT: During the SAM registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner Identification Number" (MPIN). The EBIZ POC will need the MPIN to complete the Grants.gov registration process.] When you have completed the Grants.gov registration process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step.

### **3. Application Receipt Notices**

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four e-mails are:

- Number 1 - Grants.gov Submission Receipt Number
- Number 2 - Grants.gov Submission Validation Receipt for Application Number
- Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

## Section V - APPLICATION REVIEW INFORMATION

### A. CRITERIA

#### 1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the funding opportunity announcement has been submitted; and (3) the proposed project is responsive to the objectives of the funding opportunity announcement. Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

#### 2. Merit Review Criteria

##### **TECHNICAL APPROACH AND PROJECT MANAGEMENT (CRITERION 1)**

##### **WEIGHT: 35%**

This criterion will evaluate the approach taken by the applicant and the degree to which the proposed technology or methodology meets the stated objectives of the Announcement:

- Feasibility that the proposed technology or product will address the need or problem.
- Soundness of the proposed approach and likelihood of success as demonstrated through scientific or engineering merit of the proposed approach.
- Reasonableness and completeness of the proposed SOPO to achieve project objectives and measure success.
- Comprehensiveness of the Project Management Plan (PMP) in explaining how the project will be managed using sound management principles to achieve stated objectives on time and within budget, including identification and coordination of team member roles and responsibilities, go/no-go decision criteria, and risk assessment/mitigation plan.
- Reasonableness and appropriateness of the proposed schedule, including milestones, deliverables and go/no-go decision points.
- Clarity and completeness of the proposed Data Management Plan to disseminate results of research to others and to effectively manage data produced among the team members, while taking into consideration legal and regulatory issues, including intellectual property.

##### **ENERGY SECTOR IMPACT (CRITERION 2)**

##### **WEIGHT: (30%)**

This criterion will evaluate the degree to which the proposed technology or methodology will impact the energy sector's cybersecurity capability:

- Significance of the benefits and impact of the proposed technology or product compared with current technologies, products or practices and the thoroughness of the discussion in terms of anticipated performance improvements (technical, operational, and environmental aspects) and cost savings of the proposed technology or product over current practices.
- Extent to which the proposed project meets or exceeds the research and development objectives of Roadmap vision that includes DOE program goals, as stated in this Announcement and thoroughness of the discussion that substantiates the research gap(s) that this project intends to address.

- Degree to which the technology will have broad applicability to the U.S. energy delivery sector, and the potential for the selected demonstration (or field test) site to confirm the extent of its technical relevance across the industry.

**COMMERCIALIZATION POTENTIAL (CRITERION 3)**

**WEIGHT: (20%)**

This criterion will evaluate the degree to which the Applicant demonstrates an effective commercialization strategy for the proposed technology or methodology in the energy infrastructure cybersecurity industry:

- Feasibility of the commercialization strategy for the proposed technology or product and the degree to which it will meet the needs of the energy sector in a cost effective manner.
- Applicant’s demonstrated success in commercializing similar technologies and products including those developed by the applicant.
- Reasonableness of the proposed approach to provide a path for energy sector acceptance by asset owners/operators and commercialization through solution providers (e.g., vendor).

**COLLABORATION (CRITERION 4)**

**WEIGHT: (15%)**

This criterion will evaluate the degree to which the Applicant builds on past efforts and collaborations to achieve the best possible outcomes at the best value for the Government including:

- Effectiveness of the proposed strategic approach to establish a partnership with cybersecurity stakeholders in the energy sector including but not limited to industry, energy utilities (i.e., asset owners and operators), vendors, and FFRDCs for collaborations and cooperation.
- Extent to which the Applicant’s approach would lead to dissemination of lessons learned and foster collaboration with entities not immediately involved with the project.
- Degree to which commitment is demonstrated by including letters of intent from all proposed team members.

**3. Other Selection Factors**

**Program Policy Factors**

The Selection Official may consider the following program policy factors in the selection process:

It may be desirable to select project(s) that:

1. Add technical diversity to the CEDS Portfolio;
2. Support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the research goals and objectives;
3. Represent different kinds and sizes of organizations in order to provide a balanced programmatic effort and a variety of different technical perspectives;
4. Represent a diversity of technologies and technical approaches, methods, and Topic Areas in order to provide a balanced programmatic effort and a variety of different technical perspectives.
5. Demonstrate solutions that are scalable and cost-effective with a clear industry acceptance for commercialization.
6. Are of less technical merit than other project(s) if such a selection will optimize use of available

funds by allowing more projects to be supported and not be detrimental to the overall objectives of the program;

7. Reduce Federal investment and maximize corporate commitment as demonstrated by cost share levels that exceed the minimum required.

## **B. REVIEW AND SELECTION PROCESS**

### **1. Merit Review**

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance." This guide is available at <http://energy.gov/management/office-management/operational-management/financial-assistance> under Financial Assistance Policy and Guidance.

### **2. Selection**

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

#### **Recipient Integrity and Performance Matters (DECEMBER 2015)**

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 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 §200.205 Federal awarding agency review of risk posed by applicants.

### **3. Discussions and Award**

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation]; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

## **C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES**

DOE anticipates notifying applicants selected for award by July 15, 2016 and making awards by September 15, 2016.

## **Section VI - AWARD ADMINISTRATION INFORMATION**

### **A. AWARD NOTICES**

#### **1. Notices of Selection**

##### **Selected Applicants Notification**

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Section IV.G with respect to the allowability of pre-award costs.)

##### **Non-selected Notification**

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

#### **2. Notice of Award (December 2014)**

An Assistance Agreement issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE; (4) 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation]; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, awards made under this funding opportunity should include the government-wide Research Terms and Conditions. A new version of the Terms and Conditions based on the changes to 2 CFR 200 is not yet available. Once the Terms and Conditions become available, they will be located at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>. If an award is made under this funding opportunity before the Terms and Conditions are posted, alternative Terms and Conditions may be included in the award.

### **B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS**

#### **1. Administrative Requirements (December 2014)**

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation] (See: <http://www.eCFR.gov>). For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, awards made under this funding opportunity will include the government-wide Research Terms and Conditions. A new version of these Terms and Conditions based on the changes to 2 CFR 200 is not yet available. Once they become available, they will be located at

<http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>

If an award is made under this funding opportunity before the Terms and Conditions are posted, alternative Terms and Conditions may be included in the award.

## **DUNS AND SAM REQUIREMENTS**

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: <http://www.eCFR.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <http://www.sam.gov>. SAM is the government-wide system that replaced the Central Contractor Registration (CCR). If you had an active registration in the CCR, you have an active registration in SAM. Subawardees at all tiers must obtain Data Universal Numbering System (DUNS) numbers and provide the DUNS to the prime awardee before the subaward can be issued.

## **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. (See: <http://www.eCFR.gov>). Prime awardees must register with the new FSRs database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the System for Award Management (SAM).

### **2. Special Terms and Conditions and National Policy Requirements (December 2014)**

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

The National Policy Assurances To Be Incorporated As Award Terms are located at <http://www.nsf.gov/bfa/dias/policy/rct/appc.pdf>

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>

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

## **NONDISCLOSURE AND CONFIDENTIALITY AGREEMENTS REPRESENTATIONS (JUNE 2015)**

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

- (1) It does not and will not require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.
- (2) It does not and will not use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:
  - a. “These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a

violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”

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

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

### **Corporate Felony Conviction and Federal Tax Liability Representations (MARCH 2014)**

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

(1) It is not a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months; and

(2) 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 definition applies:

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.

### **Foreign National Involvement**

All applicants selected for an award resulting from this FOA may be required to provide information to DOE in order to facilitate our responsibilities associated with foreign national access to DOE sites, information, technologies, equipment, programs or personnel. 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 the selected applicant, including subrecipients/contractors, anticipates utilizing a foreign national in the performance of an award, the selected applicant may be responsible for providing to the DOE specific information about the foreign national(s) to ensure compliance with all of the requirements for access approval. Access approval for individuals from countries identified on the U.S. Department of State list of [State Sponsors of Terrorism](#) must receive final approval authority from the Secretary of Energy before they can commence work.

### **Statement of Substantial Involvement**

There will be substantial involvement on behalf of the DOE and the recipient during performance of the resultant cooperative agreement(s).

### ***Recipient Responsibilities:***

- Performing the project activities supported by the award in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services.
- Managing and controlling project activities in accordance with its own established processes and procedures to ensure tasks and subtasks are completed within schedule and budget constraints defined by the current Project Management Plan.
- Implementing an approach to identify, analyze, and respond to project risks that is commensurate with the complexity of the project.
- Defining and revising approaches and plans, submitting the plans to DOE for review, and incorporating DOE comments.
- Coordinating related project activities with team members and external stakeholders to ensure effective integration of all work elements.
- Attending periodic program review meetings and reporting project status.
- Submitting technical reports and addressing DOE comments.
- Presenting the project results at appropriate technical conferences or meetings as directed by the DOE Project Officer (number of conferences/meetings should be determined by the Project Officer).

### ***DOE Responsibilities:***

- Reviewing in a timely manner project plans, including project management, testing and technology transfer plans, and recommending alternate approaches, if the plans do not address critical programmatic issues.
- Participating in project management planning activities, including risk analysis, to ensure DOE program requirements or limitations are considered in performance of the work elements.
- Conducting periodic program review meetings to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches or shifting work emphasis, if needed.
- Integrating and redirecting the work effort to ensure that project results address critical system and programmatic goals established by DOE OE, in coordination with the DOE CEDS Program. Specific integration to ensure the work aligns with the *Roadmap to Achieve Energy Delivery Systems Cybersecurity*.
- Reviewing scientific/technical reports to ensure programmatic needs and the requirements of the Financial Assistance award instrument, including intellectual property rights, are satisfied and providing comments to the recipient in a timely manner.
- Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications.
- Serving as scientific/technical liaison between recipients and other program or industry staff.
- Participating in major project decision-making processes associated with:
- Review of potential environmental impacts and mitigation options considered under National Environmental Policy Act (NEPA);
- Preliminary and detailed design;
- Serving as the liaison between the recipient and other agencies and organizations necessary to satisfy public law and regulations, such as the National Historic Preservation Act (NHPA).

## **C. REPORTING**

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



Forms.

## **Section VII - QUESTIONS/AGENCY CONTACTS**

### **A. QUESTIONS**

Questions regarding the content of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions and comments concerning this FOA shall be submitted not later than 14 calendar days prior to the application due date. Questions submitted after that date may not allow the Government sufficient time to respond.

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

### **B. AGENCY CONTACT**

Name: Anne Cary  
E-mail: anne.cary@netl.doe.gov

## Section VIII - OTHER INFORMATION

### **A. MODIFICATIONS**

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

### **B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE**

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

### **C. COMMITMENT OF PUBLIC FUNDS**

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

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

### **D. PROPRIETARY APPLICATION INFORMATION**

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

"The data contained in pages [*Insert pages*] of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

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

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

### **E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL**

In conducting the merit review evaluation, the Government may seek the advice of qualified non Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine,

nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

## **F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM**

**Patent Rights.** The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

**Rights in Technical Data.** Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

### **Program Covered Under Special Protected Data (December 2014)**

**Special Protected Data Statutes.** This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to five years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data Programs Covered Under Special Protected Data Statutes (Item 4 under 2 CFR 910 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and will also identify data that will be recognized by the parties as protected data.

## **G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER**

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784 see <http://www.energy.gov/gc/services/technology-transfer-and-procurement/office-assistant-general-counsel-technology-transf-1> for further information. Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

## **H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES**

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

## **I. CONFERENCE SPENDING (FEBRUARY 2015)**

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the 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.

## **J. PERFORMANCE OF WORK IN THE UNITED STATES WAIVER REQUEST**

As set forth in Section III.D., at least 100 percent of the direct labor cost for the project (including subrecipient labor) must be incurred in the United States, unless the Recipient can demonstrate to the satisfaction of the DOE that the United States' economic interest will be better served through a greater percentage of the work being performed outside of the United States.

To request a waiver for this requirement, the Applicant must submit a waiver request in its Application that includes the following information: entity name, description of work to be performed outside the United States and the location where the work will be performed. Waiver requests must explain how the waiver would further the purposes of this FOA and otherwise serve the interests of the United States and the DOE. The Contracting Officer may require additional information before considering the waiver request. Save the Waiver Request(s) in a single file titled: "PerformanceofWork\_Waiver.pdf"

## **APPENDIX A - DATA MANAGEMENT PLAN**

A data management plan (DMP) explains how data generated in the course of the work performed under this award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

### **DMP Requirements**

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

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

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

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

### **Data Determination for a DMP**

The Principal Investigators from the Prime Recipient Organization and the Sub-Recipient Organizations should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.

For data that will be generated through the course of the proposed work, the Principal Investigator should indicate what types of data should be protected from immediate public disclosure by DOE (referred to as “protected data”) and what types of data that DOE should be able to release immediately (referred to as “unlimited rights data”). Similarly, for proprietary data developed outside of the proposed work at private expense

that will be used in the course of the proposed work (referred to as “limited rights data”), the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential. Any use of limited rights data or labeling of data as “protected data” must be consistent with the DMP Requirements noted above.

### **Suggested Elements for a DMP**

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

- **Data Types and Sources:** A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.
- **Content and Format:** A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards.

Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

- **Sharing and Preservation:** A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation.
- **Protection:** A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

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

#### Additional Guidance

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

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

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

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

#### **Definitions**

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

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

**Digital Research Data:** The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

**Research Data:** The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples).

Research data also do not include:

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



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

Validate: In the context of DMPs, validate means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.