DEPARTMENT OF ENERGY (DOE)
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY (EERE)

MARINE AND HYDROKINETIC ENERGY CONVERSION AND ENVIRONMENTAL MONITORING TECHNOLOGY ADVANCEMENT

Funding Opportunity Announcement (FOA) Number: DE-FOA-0001418
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FOA Issue Date:	3/01/2016
Informational Webinar:	3/08/2016, 2:00pm ET
Pacific Northwest National Lab Facilities and Capabilities Webinar:	3/09/2016, 2:00pm ET
Submission Deadline for Concept Papers:	3/31/2016, 5:00pm ET
Submission Deadline for Full Applications:	5/26/2016, 5:00pm ET
Expected Submission Deadline for Replies to Reviewer Comments:	~~7/08/2016, 5:00pm ET~~ 7/14/2016, 5:00pm ET
Expected Date for EERE Selection Notifications:	~~8/15/2016~~ 8/31/2016
Expected Timeframe for Award Negotiations:	~~8/15/2016 – 9/30/2016~~ 8/31/2016 – 11/30/2016

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

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

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

Modifications

All modifications to the Funding Opportunity Announcement are highlighted in the body of the FOA.

Mod. No.	Date	Description of Modification
0001	3/24/2016	1. Page 17 - Text modified to clarify that applicants should outline proposed PNNL involvement in their application. 2. Page 17-18 - Text modified to clarify that any requested work for PNNL that exceeds what is finalized during award negotiations will be considered outside the scope of the award and the project recipient must use other (non-award) funds to cover the cost. 3. Page 59 - Merit Review Criterion 1 for Topic Area 2 modified to include reference to the technical criteria presented in Tables 3 and 4. Changes incorporated in "Topic Area 1 Cost and Performance Template" (See "Required Application Documents" for this FOA in EERE Exchange): 1. In the "Resource&Performance - Current" worksheet: Corrected the "Energy Production" calculation in columns D and G by multiplying by the "Resource Frequency Normalizer" in cell B13. 2. In the "Cost Breakdown Structure" worksheet: Removed the auto calculation of the cost values in cells G16 and G279. The values in these cells should be entered by the Applicant.
0002	5/13/2016	Revise the dates for three FOA activities, as shown in the table on page 1 above.

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I. FUNDING OPPORTUNITY DESCRIPTION

A. DESCRIPTION/BACKGROUND

The mission of the DOE Water Power Program (Program) is to support research, testing, and development of innovative technologies capable of generating renewable, environmentally responsible and cost-effective electricity from U.S. water resources. DOE invests in marine and hydrokinetic (MHK[1]) technologies that generate energy from water resources in order to advance technology performance and readiness, while reducing market barriers, with the overall goal of developing a robust and competitive MHK industry in the United States. This FOA announces DOE's intent to support MHK research and development (R&D) projects in two Topic Areas: (1) design and test full-scale MHK systems that integrate advanced hardware and software technologies, and (2) support the development and innovation of technologies for monitoring the environmental impacts of MHK technologies.

U.S. citizens and lawful permanent residents, for-profit entities, educational institutions, nonprofits that are incorporated in the United States, state, local, and tribal government entities are eligible to apply for funding as a Prime Recipient or Subrecipient. Federal agencies and instrumentalities, all Federally Funded Research and Development Centers (FFRDCs), and all Government-Owned, Government-Operated laboratories (GOGOs) are eligible to apply for funding as a Subrecipient, but are not eligible to apply as a Prime Recipient.

Topic Area 1: Advanced Technology Integration and Demonstration

The overall goal of Topic Area 1 (TA 1) is to help wave and current energy (i.e. tidal, ocean, and river current) electricity generation systems achieve a Levelized Cost of Energy (LCOE) target of 15 c/kWh by 2030. One of the primary reasons that the LCOE of today's systems is higher than this target is because MHK developers have, out of necessity, been forced to use hardware and software technologies that were not optimized for extended use in the harsh marine environment. In this regard, DOE believes that substantial MHK system performance gains can be realized through the integration of technologies that are designed specifically for MHK applications.

Accordingly, the objective of TA 1 awards is to support projects that show potential to significantly improve LCOE and Annual Energy Production (AEP) through the integration of advanced technologies into existing MHK system designs, with the goal of demonstrating the full potential of today's most promising MHK systems. At the completion of successful TA 1 projects, awardees will have:

- Integrated an MHK hardware and/or software technology into an optimized electricity generation system design
- Fabricated a full-scale system prototype

[1] As defined in Section 632 of the Energy Independence and Security Act of 2007 http://www.gpo.gov/fdsys/pkg/BILLS-110hr6enr/pdf/BILLS-110hr6enr.pdf

- Installed and demonstrated the system during a 1-year open water testing campaign
- Demonstrated credible improvements in AEP and LCOE

Achieving these goals will advance MHK technologies towards commercial viability, thus leading to increased investor, public, and regulatory confidence in the potential of the MHK industry.

Topic Area 2: Innovation, Testing, and Validation of MHK Environmental Monitoring Instrumentation Performance

The overarching objective of Topic Area 2 (TA 2) is to develop instrumentation that will facilitate data collection as a means to reduce environmental risk for MHK developers, ultimately reducing time and costs of environmental monitoring for future projects. Specifically, TA 2 will support the innovative improvement, testing, and validation of monitoring technologies and the associated data-processing software needed to produce fit-for-purpose, cost effective environmental monitoring tools ready for use by the MHK-community. Building upon previous support for instrumentation development, this Topic Area is meant to provide the final innovation, testing and validation needed to deliver reliable and cost-effective instrumentation that are ready for use at MHK projects.

Uncertainty surrounding the environmental impacts of MHK devices has resulted in long and costly permitting processes and onerous baseline and post-installation monitoring requirements. Meeting these monitoring requirements can be difficult as many existing environmental monitoring technologies have not been tested in, tailored to, or validated for use in the extreme, high-energy, and often low-visibility conditions of MHK sites. An additional challenge for most instrumentation types is the processing and analysis of the large data streams collected during environmental monitoring. Previous research and development has made important strides towards addressing these hurdles, yet technical challenges persist and the costs associated with data collection and analysis are still prohibitive. TA 2 is designed to produce cost-effective, advanced-technology readiness level (TRL) tools and technologies with demonstrated ability to accurately monitor potential environmental impacts of high regulatory concern in harsh MHK environments. Environmental concerns to be addressed include, but are not limited to: acoustic outputs of MHK devices; electromagnetic fields created by MHK devices, subsea cables and associated equipment; and the interactions between MHK devices and marine animals. Over the course of the projects, awardees are expected to demonstrate (1) achievement of technical performance targets for hardware and software and (2) overall cost reductions for data collection and processing when compared with an instrument's initial performance and, where applicable, with current commercial off-the-shelf monitoring technologies.

B. TOPIC AREAS (TA)/TECHNICAL AREAS OF INTEREST

TOPIC AREA 1: ADVANCED TECHNOLOGY INTEGRATION AND DEMONSTRATION

i. Topic Area 1 Overview

The overall goal of TA 1 is to support technology advancements in wave and current (i.e. tidal, ocean, and river in-stream) energy systems that are needed to achieve an LCOE of 15 c/kWh by 2030. To achieve this goal, TA 1 awards have the specific objective of supporting projects that significantly improve MHK electricity generation system performance, LCOE, and AEP by integrating innovative hardware and software technologies (e.g. generators, power take-off systems, device structures, control systems, etc.) that were developed specifically for MHK applications. In order to ensure that TA 1 projects have the potential to achieve an LCOE of 15 c/kWh by 2030, DOE will perform a special purpose LCOE review (see Appendix E) during the TA 1 merit review process.

DOE anticipates making three awards with a maximum value of $5.35M per award, for a total of up to $16.05M. Of the three TA 1 awards, DOE anticipates that two awards will support wave energy technologies and one award will support current energy technologies (i.e. tidal, ocean, and river current). TA 1 awards will have a period of performance of up to 54 months, broken into three budget periods (BPs) that are separated by go/no-go reviews. TA 1 non-federal cost share will be a minimum of 20% for BP 1 and a minimum of 50% for BP 2&3. Section I.B.ii, Table 1, and Table 2 provide more information on the budget and scope of TA 1 awards.

For Topic Area 1, DOE strongly encourages applicants to perform all work within the United States, and DOE may consider the percentage of work performed in the US when making funding decisions (see relevant Program Policy Factor in Section V.C). DOE will consider applications that propose to perform testing activities at international testing centers that provide infrastructure, pre-permitted test berths, and logistical support that maximize project value to the applicant and DOE. Note, however, that the applicant must justify why the work scope cannot be performed within the U.S. Section IV.D.12, Section IV.J, and Appendix C provide more detail and requirements for applications that propose work outside of the U.S.

ii. Topic Area 1 Scope, Schedule, and Budget

TA 1 projects must be broken into three BPs that are separated by go/no-go reviews. Each BP should contain the following work scope:

BP 1 – Design: Integrate a hardware or software technology developed for wave or current energy conversion systems into a system design.
BP 2 – Build: Fabricate a full-scale system prototype for use in an open water testing campaign and perform necessary pre-deployment laboratory testing.
BP 3 – Deploy, Test, and Decommission: Install and comprehensively test the system performance through a 1-year open water testing campaign. Finally, decommission the system. Devices that are tested under TA 1 awards are not required to be grid connected during the device testing phase of the project.

Table 1 provides details on DOE funding for TA 1 projects. The maximum DOE contribution to TA 1 projects is $5.35M. Awardees should determine the appropriate funding amount for each BP within the following constraints: (1) the maximum DOE funding level for BP 1 is $1M, (2) the maximum DOE funding level for BP2 is $2.75M, and (3) the maximum funding level for BP 3 is $2.75M. Cost share requirements are a minimum of 20% for BP 1 and a minimum of 50% for BP 2&3. The financial viability of all project, including cost share contributions, will be evaluated during the merit review process (see Section V.A).

Table 2 describes requirements for the tasks, deliverables, and duration of each BP. The specific tasks, schedule, and budget should be proposed and justified by the applicant, while staying within the requirements detailed in Table 2. Note that no procurement, fabrication, or deployment activities may take place during BP 1.

Table 1. TA 1 DOE funding and cost share requirements.

Budget period	Maximum DOE funding	Minimum non-federal cost share
1	$1M	20%
2	$2.75M	50%
3	$2.75M	50%
BP 1-3 combined	$5.35M	

Table 2. TA 1 project tasks and deliverables requirements

	Tasks to be Performed	Minimum required deliverables	Duration
BP1: Design	• Develop an energy conversion system design that integrates an advanced technology developed specifically for marine energy applications • Develop a system fabrication plan with defensible cost estimates (e.g. cost estimates supported with quotes) • Confirm open water test location and perform necessary site and resource characterization tasks • Develop a preliminary IO&M and testing plan • Develop a risk management plan • Establish contact with all necessary state and federal permitting and regulatory bodies, develop a plan to obtain required permits and comply with relevant regulations, and begin required permitting processes	• Project management plan • Preliminary IO&M and testing plan • System fabrication plan • Risk management plan and risk register • Permitting status report and BP2&3 permitting plan • Updated TA 1 metrics table (See the MHK Cost and Performance Template) • Complete LCOE content model and LCOE reporting according to DOE guidance for the baseline system and the system with advanced technology integrated • Complete system overview and component overview content models • BP 1 report describing the advanced technology and final system design • Project data uploaded to the MHK Data Repository (mhkdr.openei.org)	Proposed by applicant, maximum of 18 months
Go/No-Go 1	• Participate in go/no-go meeting • Decision criteria will include but are not limited to: o Satisfactory completion of BP1 work scope and deliverables o LCOE projections are on track to meet goals stated in the metrics table o Likelihood that the project can be completed on schedule and budget in BP 2&3 o Proof of financial viability		2 months, will take place during BP 1 to ensure project continuity

BP2: Build	• Finalize IO&M and testing plan • Completed system fabrication with advanced technology integrated • Design, fabricate, and integrate instrumentation package • Secure required deployment infrastructure (e.g. deployment vessels) • Continue contact with all necessary state and federal permitting and regulatory bodies, update the plan to obtain required permits and comply with relevant regulations, and continue required permitting processes	• Final IO&M and testing plan • Updated risk management plan and risk register • Permitting status report and BP 3 permitting plan • Updated TA 1 metrics table (see the MHK Cost and Performance Reporting Template) • Update LCOE reporting according to DOE guidance for system with advanced technology integrated • Update system overview and component overview content models • BP 2 report describing overall project progress, details of system fabrication, and the instrumentation system design and fabrication • Project data uploaded to the MHK Data Repository (mhkdr.openei.org)	Proposed by applicant, maximum of 18 months
Go/No-Go 2	• Participate in go/no-go meeting • Decision criteria will include but are not limited to: o Satisfactory completion of BP 2 work scope and deliverables o LCOE projections are on track to meet goals stated in the metrics table o Likelihood that the project can be completed on schedule and budget in BP 3 o Proof of financial viability		2 months, will take place during BP 2 to ensure project continuity
BP3: Deploy, Test, and Decommission	• Deploy the system at the test location • Test the system and gather system performance data for at least 12 months • Perform a detailed analysis of experimental measurements • Conduct activities required for regulatory compliance • Recover and decommission system	• Updated risk management plan and risk register • Updated TA 1 metrics table (see the MHK Cost and Performance Template) • Update LCOE reporting according to DOE guidance for system with advanced technology integrated • Update system overview, component overview content, and the applicable field testing content models • Final report describing project progress, IO&M, testing activities, and decommissioning activities, technology and system performance, lessons learned, and next steps in technology development and commercialization • Upload comprehensive project data the MHK Data Repository (mhkdr.openei.org)	Proposed by applicant, maximum of 18 months
Total			Maximum of 54

TOPIC AREA 2: INNOVATION, TESTING, AND VALIDATION OF MHK ENVIRONMENTAL MONITORING INSTRUMENTATION PERFORMANCE

1. Topic Area 2 Overview

There are a variety of challenges associated with environmental monitoring in harsh environments, including suboptimal technical performance and the costs of monitoring instrumentation, deployment, retrieval and data analysis. The objective of this Topic Area is to support the final innovative improvements, testing and validation of environmental monitoring technologies and the associated data-processing software in representative MHK field environments. **Successful projects within this Topic Area will improve the technical performance of monitoring instrumentation, reduce the overall costs associated with data collection and analysis, and will result in fit-for-purpose, cost-effective tools ready to be used for environmental monitoring by the MHK-community**.

Topic Area 2 is divided into four focus areas to address specific stressors or monitoring targets of high regulatory concern. The focus areas of interest and the amount of funding available per award are outlined below. TA 2 projects can have up to a three year duration and specific

information on the technical performance details that should be included in applications for each focus area, and priority areas for improvement are detailed in Table 3 and Table 4. Applications for technologies that monitor environmental impacts different from the suggested focus areas will be considered if the applicant can demonstrate how the technology addresses a high priority need related to regulatory requirements at MHK device deployments.

1. **Acoustic Outputs (Up to $750,000 per award):** This focus area will support the innovative improvement, testing and validation of technologies designed to monitor the acoustic signature of an operational MHK device, baseline noise, and data processing techniques to analyze the collected data. The desired end-product is a fit-for-purpose, cost-effective prototype ready for commercialization and to be used for environmental monitoring by the MHK community.
2. **Electromagnetic Fields (Up to $750,000 per award):** This focus area will support the innovation, testing and validation of technologies designed to measure baseline electromagnetic fields (EMF), and the changes in electromagnetic fields attributed to MHK devices, associated subsea cables, junction boxes, and other related equipment. This focus area aims to develop a research grade, validated device for measuring EMF signatures to address many of the research questions persisting around the impacts of EMF.
3. **Marine Organism Monitoring (Up to $750,000 per award):** This focus area will support the innovative improvement, testing and validation of technologies to monitor for baseline marine organism activity, interactions with MHK devices, and methods for processing the large amounts of data typically collected during these activities. This focus area could include optical methods such as visual cameras, or LiDAR, acoustic methods such as sonar, acoustic cameras, or any alternative methods. The desired end-product is a fit-for-purpose, cost-effective prototype ready for commercialization and to be used for environmental monitoring by the MHK community.
4. **Integrated Sensor Packages (Up to $1,100,000 per award):** This focus area will support the testing, improvement, and validation of integrated systems using multiple instruments or sensors coupled together to address one or more of the previously listed focus areas (acoustics, EMF or marine organism monitoring). The desired end-product is a fit-for-purpose, cost-effective prototype ready for commercialization and to be used for environmental monitoring by the MHK community.

DOE encourages all applicants to describe their strategy to reduce the time and cost associated with data processing and analysis. Applicants are also encouraged to focus on supporting both hardware and software improvements.

Where gaps in expertise of the prime recipient exist, DOE encourages teaming relationships with FFRDCs and other entities in order to ensure the project team has the most relevant and robust expertise.

iii. Topic Area 2 Scope and Application Requirements

Applicants will be asked to set end-of-project cost and performance targets. These targets should (1) represent significant improvements in technical performance from baseline performance, (2) demonstrate end-of-project technical readiness for deployment at MHK projects, and (3) exhibit improvements in cost and performance over commercial off-the-shelf (COTS) monitoring equipment, as described later in this Section. Progress towards these targets will be demonstrated through in-water testing over the course of the project. Where applicable, awardees' technologies may be compared to existing commercial off-the-shelf (COTS) monitoring technologies to demonstrate the benefits beyond what is currently available.

A. Applicants for this topic area should have an existing, working technology that has undergone testing in tank or field settings in order to establish baseline performance.
B. Applications should clearly identify the current technical capabilities and costs associated with the monitoring technology, proposed improvements to be made by end of project and how those improvements will benefit the technical performance and reduce total costs for data collection and analysis.
C. By the end of the award, the applicant's technology should meet or exceed the technical performance enhancement and cost reduction goals outlined in their application. This will be monitored annually through go/no-go decisions, and reasonable amendments to the goals may be made if needed.
D. For evaluation purposes, all applicants are asked to identify the best available, comparable COTS technology (where applicable) and discuss how end-of-project performance and cost goals will exceed that of current technologies. If no directly comparable COTS technology exists, applicants should indicate how measurements are currently conducted and highlight the benefits of the proposed technology.
E. Where appropriate, applicant technologies and COTS technologies may be operated concurrently during the in-water testing activities at the end of the project period. The results from the COTS and applicant technologies will be compared in all technical and cost performance categories (see below), as well as the relative performance ranked per unit cost. If side-by-side comparison occurs, the goal is for awardees technology to demonstrate superior performance and/or cost reductions when tested alongside COTS technologies.

Applicants must also include the following information on current and projected (at project end) costs and technical performance in their applications:

Cost Performance

- **Instrumentation** – Current commercial cost (in U.S. dollars) of all hardware needed for the technology and projected cost at project end after improvements are made.
- **Platform** – Current cost (in U.S. dollars) of all components needed for the instrumentation platform (e.g. moorings, anchors, specific structural needs) and projected cost at project end after improvements are made.
- **Data Management and Analysis** – Current level of automation for data collection and processing, processing time per unit data, amount of data generated per unit time, data bandwidth needed, level of processing and automated analysis (e.g. clean signal, target

enumeration or target identification), and anticipated values for each factor at project end after improvements are made.

- **Deployment, Retrieval, and Operation & Maintenance (O&M)** – Current methodology for deployment, retrieval and O&M and the projected cost of proposed improvements.

Technical Performance

High priority areas for technical improvements are presented in Table 4. Specific technical performance requirements for TA 2 projects are:

- Identify and document the type, location (i.e. laboratory, field), and duration of testing performed to date.
- Identify the current and projected technical performance of the instrument relative to the best COTS technology or currently utilized methodology in the following performance categories (additional details available in Table 3):
    - Detection
    - Classification
    - Duration of deployment
    - Range of applicability
    - Additional information as applicant deems appropriate

Table 3. Specific current and projected (at project end) technical information to be included in the application by focus area.

Performance Category	FOCUS AREA			
	Acoustics	**EMF**	**Marine Organism Monitoring**	**Integrated Sensor Packages**
Detection	• Range of frequencies detected • Upper and lower dB detection • Location accuracy for the monitoring device relative to the source	• Ability to detect both e-field and B-field levels above ambient • Upper and lower measurement threshold • Level of sensitivity, and range of measurement	• Detection efficiency (% accuracy of targets vs false positives) • Ability (and efficiency) to measure direct physical contact • Field of view and range of detection	• Detailed information on what the system is designed to detect • Depending on system, refer back to relevant requirements in other focus areas
Classification	• Method and accuracy of ambient noise removal • Method and accuracy of flow noise removal	• Ability to differentiate between background and anomalies in e-field and B-field	• Ability to distinguish between animals and debris • Level of taxonomic classification	• Detailed information on what the system is designed to detect • Depending on system, refer back to relevant requirements in other focus areas
Duration of Deployment	• Ability to deploy autonomously to monitor over wider range of conditions, including highly energetic/rough periods	• Ability to deploy autonomously to monitor over wider range of conditions, including highly energetic/rough periods	• Length of time instrument can be deployed without maintenance	• Length of time instrument can be deployed without maintenance
Range of Applicability	• Ability to detect the source and remove ambient and flow noise from a variety of conditions (e.g. nearshore/offshore, high energy)	• Ability to measure EMF in the water column, and maintain safe distance from MHK device and infrastructure	• Ability to also measure baseline activity • Range of environmental conditions and MHK device types where instrument can be deployed • Types of organisms that can be detected	• Ability to deploy in a range of water depths and in the water column

Table 4. Priority Areas for technical improvement within each focus area.

	FOCUS AREA			
	Acoustics	**EMF**	**Marine Organism Monitoring**	**Integrated Sensor Packages**
Priority Improvement Areas	**1. Improved geolocation ability in high energy wave or current environments** **2. Improved ability to extract MHK generated noise from background and pseudo noise** **3. User friendly data presentation and interpretation**	**4. Improved sensitivity** **5. Improved geolocation ability in high energy wave or current environments** **6. Ability to detect EMF in water column and along seabed** **7. Ability to deploy and collect data during conditions when MHK devices are generating power**	**8. Identification to lower taxonomic levels** **9. Automated identification/data processing** **10. Reduction of volume of data collected** **11. Ability to detect direct interaction (e.g., blade strike) between organisms and MHK devices, or ability to monitor avoidance and fine-scale evasion behaviors and differentiate these from direct interactions such as blade strike.**	**12. Improved communication between sensors to streamline data collection and data integration** **13. Improved interpretation and presentation of data** **14. Depending on system, refer back to relevant priorities for other focus areas**

iv. Topic Area 2 Proposed Schedule

Over the course of three years, this Topic Area will support improvement, testing, and validation of environmental monitoring technologies in conditions representative of MHK environments. DOE is asking all applicants to adhere to the timeline and testing plan outlined in Figure 1 and presented in the following list:

Year 1: Awardees will conduct in water testing in a semi-sheltered environment to validate baseline technical and cost performance.

Go/No-Go 1: A go/no-go decision will be made at the end of year 1 based on initial performance, robustness and feasibility of end-goals.

Year 2: Awardees will conduct hardware and software improvement activities. At the end of the second year, awardees will be asked to conduct a brief in-water test to demonstrate technical improvements relative to the goals outlined in the awardee application.

Go/No-Go 2: A go/no-go decision will be made based on the in-water test results and progress towards project end-goals.

Year 3: Instrument performance will be tested and costs evaluated in a more energetic environment, preferably around an MHK device. If appropriate, testing may be conducted alongside a comparable COTS technology.

TA 2 will leverage infrastructure and expertise at DOE's marine laboratory, part of the Pacific Northwest National Laboratory (PNNL), to support testing and data collection activities. Initial testing during the first and second years will occur at PNNL's Marine Sciences Laboratory, which is located in a semi-sheltered open water setting. The testing location for the third year will be identified at a later time by DOE and PNNL.

To ensure consistent evaluation across all instrumentation, PNNL and sub-contractors will assist in generating a testing plan and help conduct testing and data collection efforts during all three years. A finite period of PNNL time, resources, facilities and expertise, funded directly by DOE, will be allocated to each project for testing and improvement activities during the project period (Table 5). Applicants are encouraged to consider how they would like to utilize these capabilities (see below), and should outline proposed PNNL involvement in their applications. However, applicants **should not** contact any researchers at PNNL during application development. All utilization of PNNL's capabilities (e.g. lab facilities, vessels, divers and staff time) will be finalized during award negotiations and will be restricted to that amount of resource through the project. After contract award, the type of resource used can be modified but not the total maximum value. If the awardee decides additional PNNL resources are needed, this will be considered outside the scope of the award and the **additional** costs will be

paid by the awardee via other financial means (i.e. award funds cannot be used to cover the additional costs).

A brief overview of the types of infrastructure and staff expertise available at PNNL is provided below. A more detailed description of the type of work to be completed each year, and suggested budget allocations are available in Table 5.

Figure 1. TA2 project timeline

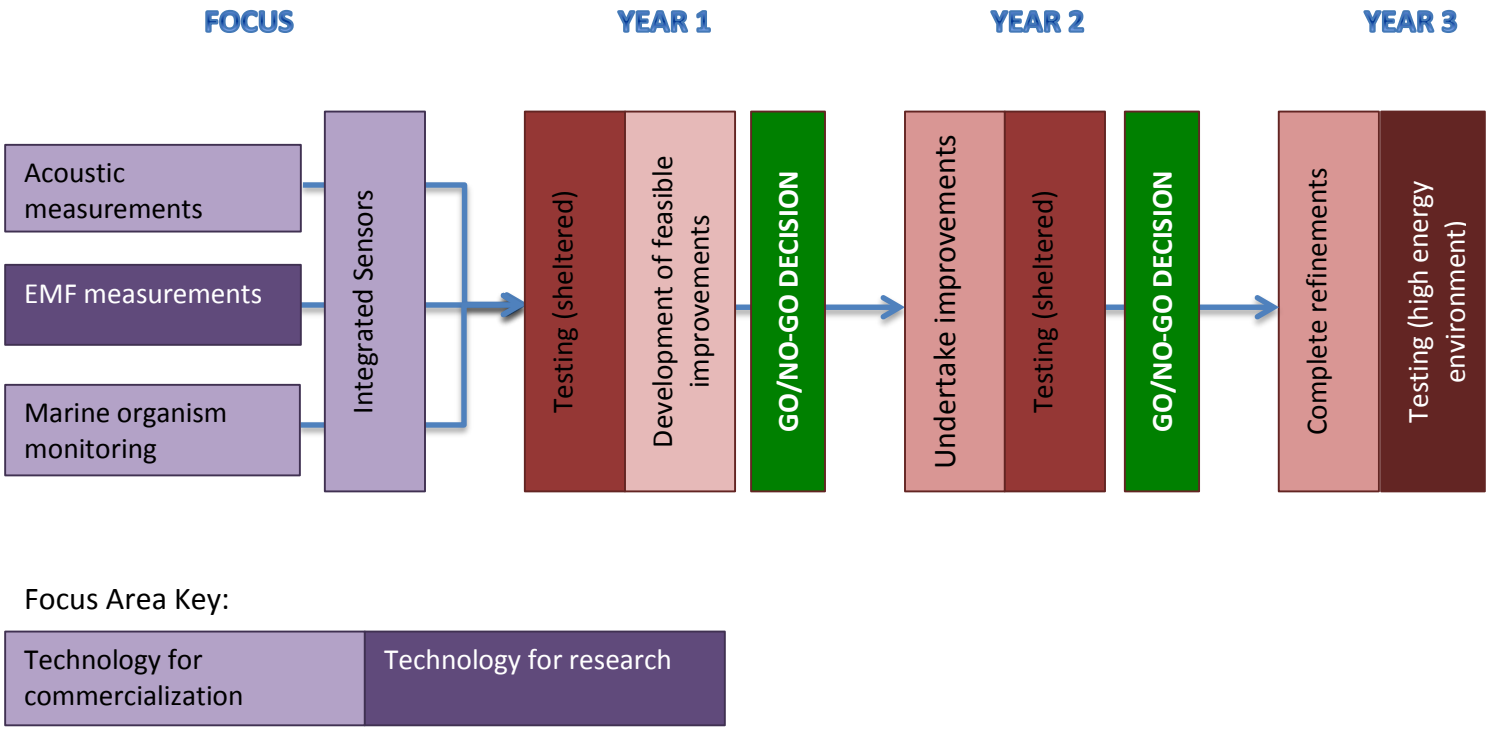

Table 5. Detailed Scope of work per budget period (BP) for Topic Area 2 applications and anticipated budget per award.

	Tasks to Be Performed	Deliverables	Approximate Duration (months)	Suggested Funding Allocation*	Support Provided by PNNL**
BP1	• Work with PNNL to develop in-water testing plan. • Demonstrate initial instrumentation and data processing technical and cost performance at PNNL's Marine Sciences Lab in Sequim Bay, WA using known targets or stressor levels. • Refine detailed plans for performance improvements and cost reductions possible over the remainder of this project and beyond.	• In water testing plan. • Report to be used in Go/No Go Decision 1, including data on baseline technical and cost performance and identification of specific plans for improvement.	10	$120,000	• Assist in development of in water testing plans. • Execute in-water testing at PNNL, up to ~3 weeks in duration. • Work with awardee to refine performance enhancement and cost reduction criteria.
Go/No -Go 1	1. Participate in the Go/No Go meeting. Decision based on: 1) Initial costs and technical performance demonstrated during BP1. 2) Projected future cost and technical performance to be achieved by project end. 3) The credibility of those projections as indicated by initial testing.		2	N.A.	N.A.
BP2	• Make technical improvements to instruments and data processing methods. • Perform second round of testing at PNNL to demonstrate improvements. • Technical performance and cost may be evaluated against current commercial off the shelf technologies, where applicable.	• Report to be used in Go/No Go Decision 2, including technical improvements made, comparison of instrumentation performance before and after improvements,	12	$480,000 for focus areas 1-3; $830,000 for focus area 4	II. Specific (and finite) expertise available to assist awardee to achieve the proposed improvements, equivalent to ~3 weeks of staff time. III. Execute in-water testing at PNNL to evaluate cost and performance after improvements, up to ~2 weeks in duration.

		and comparison to COTS technology (if applicable),			• Obtain and operate appropriate COTS technologies for concurrent testing (where applicable).
Go/No -Go 2	A. Participate in the Go/No Go meeting. Decision based on: B. Demonstration of satisfactory progress toward technical performance and cost reduction goals relative to that proposed.		2	N.A.	N.A.
BP3	1) Test monitoring instrumentation at a more energetic site selected by DOE. 2) Evaluate technical and cost performance in representative MHK environment. 3) Cross comparison among awardees in the same subtopic area and evaluation against existing, commercially available instrumentation.	4) A detailed final technical report with summary of all performed tasks, a section with user instructions and suggested methodology for monitoring a specific stressor/receptor interaction at a MHK project.	10	$150,000	1. Arrange, coordinate and execute testing at a high energy site, testing up to ~2 weeks in duration.
Total			36	$750,000 for focus areas 1-3, $1,100,000 for focus area 4	

*DOE funds only. Does not include cost share.
**DOE will fund PNNL activities separate to applicant award and support for PNNL does not need to be reflected in project budgets. Project team coordination and work with PNNL on these activities should be included.

PNNL Capabilities

As noted above, in the course of their projects, awardees will have access to a limited amount of PNNL support for testing and expertise to help further technology development. Below is a list of PNNL facilities and expertise that teams may wish to utilize during their projects. It is provided here as a reference for use during application development.

The Marine Sciences Laboratory is located at the mouth of Sequim Bay, leading into the Strait of Juan de Fuca in Washington State. Road access is suitable for flatbed trucks to the pier, leading to easy access to a protected in-water bay environment or a more exposed location in the strait.

PNNL has both the facilities to support testing and the expertise to support instrumentation development.

Facilities:

- Research pier with integral power and data connections, and floating dock
- Secure over-water WiFi network
- General purpose laboratory space and offices
- Wet laboratory space
- Flow-through capability with freshwater and seawater
- On-site waste water treatment
- Outdoor experimental tanks
- Vessels and qualified crew:
  - RV Strait Science – 28 foot research vessel with A-frame
  - SAFE boat – high performance 23 foot vessel
- Qualified scientific dive team

PNNL also has access to local sub-contractors for additional facilities, such as larger vessels, and for cranage, or welding capabilities.

Expertise:

- Acoustics:
  - Use and analysis of both passive and active acoustic systems
  - Certified hydrophone calibration facility
  - Algorithm development for acoustic cameras and sonar
  - Acoustic modeling
- EMF:

  - Field measurements
  - EMF modeling
- Marine organism monitoring:
  - Use of optical cameras in the field
  - Use of acoustic cameras in the field
  - Development of algorithms for infrared, optical video, acoustic cameras and sonar
  - Real-time and post-processing algorithm development
- General
  - Sensor integration
  - Systems engineering
  - Material science (including bio-fouling studies)
  - Marine operations, including deployment, retrieval, and mooring design
  - Surveying (for precise locations)
  - Secure communications systems and networks, both WiFi and cabled
  - Telemetry systems design and implementation
  - Data acquisition, storage, collation, and communication
  - Multi-channel data acquisition systems design and implementation
  - Pre- and post-processing algorithm development, including design of processing chips
  - Battery development and power storage
  - Automatic underwater vehicle (AUV) and remote operated vehicle (ROV) handling
  - Environmental impact, risk assessment, and permitting

Examples of how this expertise could be leveraged, include:

- Defining a framework for algorithm development, or adapting existing post-processing algorithms for real-time applications
- Modifying existing deployment platforms and techniques to improve the ease of deployment
- Definition of data protocols and hardware for remote access and two-way communication with deployed instruments

It should be noted that the applicant is responsible for defining the end point of the technology development, but that finite resources from PNNL will be available in BP 2 to assist with reaching that goal.

Work Performed Outside the United States
For Topic Area 2, all work must be performed in the United States. See Section IV.D.12, Section IV.J, and Appendix C.

C. APPLICATIONS SPECIFICALLY NOT OF INTEREST

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

- Applications that fall outside the technical parameters specified in Section I and II of the FOA.

- Applications considering energy conversion technologies that do not extract energy from ocean waves or tidal, ocean, or river currents.

- Applications for the development of Ocean Thermal Energy Conversion (OTEC) or hydropower technologies that make use of a dam, diversionary structure, or impoundment.

- Applications for proposed technologies that are not based on sound scientific principles (e.g. violates the laws of thermodynamics).

- For Topic Area 1:
    - Applications that propose using TA 1 funds to support or supplement ongoing fabrication or demonstration projects that have received federal funding or commitments of federal funding.

- For Topic Area 2:
    - Applications from awardees selected under the Environmental Stewardship for Renewable Energy Technologies: MHK Environmental and Resource Characterization Instrumentation (DE-FOA-0000917) that have not completed any tank or open water testing by the time of application.

    - Applications for environmental monitoring technologies that do not address high priority regulatory concerns.

D. AUTHORIZING STATUTES

The programmatic authorizing statute is the Energy Policy Act of 2005, section 931(a)(2)(E)(i) and the Energy Independence and Security Act of 2007 (EISA), Section 633-Marine and Hydrokinetic Renewable Energy Research and Development, Public Law 110-140 (Dec. 19, 2007).

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

IV. AWARD INFORMATION

- **AWARD OVERVIEW**

ESTIMATED FUNDING

EERE expects to make $22M of Federal funding available for new awards under this FOA, subject to the availability of appropriated funds. EERE anticipates making approximately 10 awards under this FOA. EERE may issue one, multiple, or no awards.

Individual awards may vary between $750K and $5.35M.

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

> **Topic Area 1:** Advanced Technology Integration and Demonstration: EERE may issue up to three awards in this topic area, with a maximum award amount of $5.35M, for a maximum total of $16.05M. EERE anticipates that two awards will support wave energy technologies and one award will support current energy technologies (i.e. tidal, ocean, and river current).
>
> **Topic Area 2:** Innovation, Testing and Validation of MHK Environmental Monitoring Instrumentation Performance. EERE anticipates making 2 awards to support technologies for monitoring acoustic outputs at $750,000, 1 award for EMF monitoring instrumentation at $750,000, 2 awards at $750,000 to support technologies for marine organism monitoring, and 2 awards at $1,100,000 for integrated sensor packages, for a total of $5.95M.

PERIOD OF PERFORMANCE

EERE anticipates making awards that will run up to 54 months in length for Topic Area 1 and up to 36 months for Topic Area 2. Project continuation will be contingent upon satisfactory performance and go/no-go decision review. At the go/no-go decision points, EERE will evaluate project performance, project schedule adherence, meeting milestone objectives, compliance with reporting requirements, financial viability, and overall contribution to the program goals and objectives. As a result of this evaluation, EERE will make a determination to continue the project, re-direct the project, or discontinue funding the project.

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

E. EERE FUNDING AGREEMENTS

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

COOPERATIVE AGREEMENTS

EERE generally uses Cooperative Agreements to provide financial and other support to Prime Recipients.

Through Cooperative Agreements, EERE provides financial or other support to accomplish a public purpose of support or stimulation authorized by Federal statute. Under Cooperative Agreements, the Government and Prime Recipients share responsibility for the direction of projects.

EERE has substantial involvement in all projects funded via Cooperative Agreement. See Section VI.B.9 of the FOA for more information on what substantial involvement may involve.

FUNDING AGREEMENTS WITH FFRDCS

FFRDCs, with the exception of Pacific Northwest National Laboratory, will be funded directly by the Prime Recipient. DOE will directly fund Pacific Northwest National Laboratory for TA 2 awards.

GRANTS

Although EERE has the authority to provide financial support to Prime Recipients through Grants, EERE generally does not fund projects through Grants. EERE may fund a limited number of projects through Grants, as appropriate.

TECHNOLOGY INVESTMENT AGREEMENTS

In rare cases and if determined appropriate, EERE will consider awarding a Technology Investment Agreement (TIA) to a non-FFRDC applicant. TIAs, governed by 10 CFR Part 603, are assistance instruments used to increase the involvement of commercial entities in the Department's research, development, and demonstration programs. A TIA may be either a type of cooperative agreement or an assistance transaction other than a cooperative agreement, depending on the intellectual property provisions. In both cases, TIAs are not necessarily subject to all of the requirements of 2 CFR Part 200 as amended by 2 CFR Part 910.

In a TIA, EERE may modify the standard Government terms and conditions, including but not limited to:

- Intellectual Property Provisions: EERE may negotiate special arrangements with recipients to avoid the encumbrance of existing intellectual property rights or to facilitate the commercial deployment of inventions conceived or first actually reduced to practice under the EERE funding agreement.
- Accounting Provisions: EERE may authorize the use of generally accepted accounting principles (GAAP) where recipients do not have accounting systems that comply with Government recordkeeping and reporting requirements.

EERE will be more amenable to awarding a TIA in support of an application from a consortium or a team arrangement that includes cost sharing with the private sector, as opposed to an application from a single organization. Such a consortium or teaming arrangement could include a FFRDC. If a DOE/NNSA FFRDC is a part of the consortium or teaming arrangement, the value of, and funding for the DOE/NNSA FFRDC portion of the work will be authorized and funded under the DOE field work authorization system and performed under the laboratory's Management and Operating contract. Funding for a non-DOE/NNSA FFRDC would be through an interagency agreement under the Economy Act or other statutory authority. Other appropriate contractual accommodations, such as those involving intellectual property, may be made through a "funds in" agreement to facilitate the FFRDCs participation in the consortium or teaming arrangement. If a TIA is awarded, certain types of information described in 10 CFR 603.420(b) are exempt from disclosure under the Freedom of Information Act for five years after DOE receives the information.

An applicant may request a TIA if it believes that using a TIA could benefit the RD&D objectives of the program (see section 603.225) and can document these benefits. If an applicant is seeking to negotiate a TIA, the applicant must include an explicit request in its Full Application. After an applicant is selected for award negotiation, the Contracting Officer will determine if awarding a TIA would benefit the RD&D objectives of the program in ways that likely would not happen if another type of assistance agreement (e.g., cooperative agreement subject to the requirements of 2 CFR Part 200 as amended by 2 CFR Part 910). The Contracting Officer will use the criteria in 10 CFR 603, Subpart B, to make this determination.

V. ELIGIBILITY INFORMATION

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

- **ELIGIBLE APPLICANTS**

INDIVIDUALS

U.S. citizens and lawful permanent residents are eligible to apply for funding as a Prime Recipient or Subrecipient.

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

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-Owned, Government-Operated 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.

FOREIGN ENTITIES

Foreign entities are eligible to apply for funding under this FOA. Other than as provided in the "Individuals" or "Domestic Entities" sections above, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a Prime Recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the Prime Recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

Foreign entities may request a waiver of the requirement to designate a subsidiary in the United States as the Prime Recipient in the Full Application (i.e., a foreign entity may request that it remains the Prime Recipient on an award). To do so, the Applicant must submit an explicit written waiver request in the Full Application. Appendix C lists the necessary information that must be included in a request to waive this requirement. The applicant does not have the right to appeal EERE's decision concerning a waiver request.

In the waiver request, the applicant must demonstrate to the satisfaction of EERE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to have a foreign entity serve as the Prime Recipient. EERE may require additional information before considering the waiver request.

A foreign entity may receive funding as a Subrecipient.

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 EERE Contracting Officer.

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 EERE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortium's:

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

F. COST SHARING

To assist applicants in calculating proper cost share amounts, EERE has included a cost share information sheet and sample cost share calculation as Appendices A and B to this FOA.

TOPIC AREA 1, BUDGET PERIOD 1: 20% COST SHARE REQUIREMENT

v. Cost Sharing Generally

The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC costs if applicable, and the

recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. (See 2 CFR 200.306 and 2 CFR 910.130 for the applicable cost sharing requirements.) The financial viability of all projects, including cost share considerations, will be evaluated during the merit review process (see Section V.A).

vi. Special Cost Share Waiver for Domestic Institutions of Higher Education, Domestic Nonprofit Entities, FFRDCs, or U.S. State, Local, or Tribal Government Entity

The Assistant Secretary for the Office of Energy Efficiency and Renewable Energy has issued a Cost Share Reduction determination pursuant to Section 988(b)(3) of the Energy Policy Act of 2005 that is applicable to certain entities applying under this FOA. Specifically, recipient cost share requirement for applied research and development activities projects is reduced from 20% to 10% where:

a. The Prime Recipient is a domestic institution of higher education; domestic nonprofit entity; FFRDC; or U.S. State, local, or tribal government entity; and
b. The Prime Recipient performs more than 50% of the project work, as measured by the Total Project Cost.

Applicants who believe their project qualifies for the reduced recipient cost share must be able to provide verification that the above requirements are satisfied.

TOPIC AREA 1, BUDGET PERIOD 2&3: 50% COST SHARE REQUIREMENT

The cost share must be at least 50% of the total allowable costs for demonstration projects (i.e., the sum of the Government share, including FFRDC costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law (See 2 CFR 200.306 and 2 CFR 910.130 for the applicable cost sharing requirements). The financial viability of all project, including cost share considerations, will be evaluated during the merit review process (see Section V.A).

TOPIC AREA 2: 20% COST SHARE REQUIREMENT

vii. Cost Sharing Generally

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

viii. Special Cost Share Waiver for Domestic Institutions of Higher Education, Domestic Nonprofit Entities, FFRDCs, or U.S. State, Local, or Tribal Government Entity

The Assistant Secretary for the Office of Energy Efficiency and Renewable Energy has issued a Cost Share Reduction determination pursuant to Section 988(b)(3) of the Energy Policy Act of 2005 that is applicable to certain entities applying under this FOA. Specifically, recipient cost share requirement for applied research and development activities projects is reduced from 20% to 10% where:

1. The Prime Recipient is a domestic institution of higher education; domestic nonprofit entity; FFRDC; or U.S. State, local, or tribal government entity; and
2. The Prime Recipient performs more than 50% of the project work, as measured by the Total Project Cost.

Applicants who believe their project qualifies for the reduced recipient cost share must be able to provide verification that the above requirements are satisfied.

LEGAL RESPONSIBILITY

Although the cost share requirement applies to the project as a whole, including work performed by members of the project team other than the Prime Recipient, the Prime Recipient is legally responsible for paying the entire cost share. The Prime Recipient's cost share obligation is expressed in the Assistance Agreement as a static amount in U.S. dollars (cost share amount) and as a percentage of the Total Project Cost (cost share percentage). If the funding agreement is terminated prior to the end of the project period, the Prime Recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The Prime Recipient is solely responsible for managing cost share contributions by the Project Team and enforcing cost share obligations assumed by Project Team members in subawards or related agreements.

COST SHARE ALLOCATION

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

COST SHARE TYPES AND ALLOWABILITY

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV.J.1 of the FOA. In addition, cost share must be verifiable upon submission of the Full Application.

Project Teams may provide cost share in the form of cash or in-kind contributions. Cash contributions may be provided by the Prime Recipient or Subrecipients. Allowable in-kind

contributions include, but are not limited to: personnel costs, indirect costs, facilities and administrative costs, rental value of buildings or equipment, and the value of a service, other resource, or third party in-kind contribution.

Project teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the funding was not provided to the state or local government by the Federal Government.

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

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

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

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

Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 & 10 CFR 603.525-555 for additional guidance on cost sharing.

COST SHARE CONTRIBUTIONS BY FFRDCS

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

COST SHARE VERIFICATION

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

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

COST SHARE PAYMENT

EERE requires Prime Recipients to contribute the cost share amount incrementally over the life of the award. Specifically, the Prime Recipient's cost share for each billing period must always reflect the overall cost share ratio negotiated by the parties (i.e., the total amount of cost sharing on each invoice when considered cumulatively with previous invoices must reflect, at a minimum, the cost sharing percentage negotiated).

In limited circumstances, and where it is in the government's interest, the EERE Contracting Officer may approve a request by the Prime Recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly. Regardless of the interval requested, the Prime Recipient must be up-to-date on cost share at each interval. Such requests must be sent to the Contracting Officer during award negotiations and include the following information: (1) a detailed justification for the request; (2) a proposed schedule of payments, including amounts and dates; (3) a written commitment to meet that schedule; and (4) such evidence as necessary to demonstrate that the Prime Recipient has complied with its cost share obligations to date. The Contracting Officer must approve all such requests before they go into effect.

G. COMPLIANCE CRITERIA

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

COMPLIANCE CRITERIA

ix. Concept Papers

Concept Papers are deemed compliant if:

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

x. Full Applications

Full Applications are deemed compliant if:

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

xi. Replies to Reviewer Comments

Replies to Reviewer Comments are deemed compliant if:

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

H. RESPONSIVENESS CRITERIA

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

I. OTHER ELIGIBILITY REQUIREMENTS

REQUIREMENTS FOR DOE/NNSA AND NON-DOE/NNSA FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS INCLUDED AS A SUBRECIPIENT

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

xii. Authorization for non-DOE/NNSA FFRDCs

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

xiii. Authorization for DOE/NNSA FFRDCs

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

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

xiv. Value/Funding

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

xv. Cost Share

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

xvi. Responsibility

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

xvii. Limit on FFRDC Effort

The scope of work to be performed by the FFRDC may not be more significant than the scope of work to be performed by the applicant.

J. LIMITATION ON NUMBER OF CONCEPT PAPERS AND FULL APPLICATIONS ELIGIBLE FOR REVIEW

Topic Area 1

Applicants may submit one Concept Paper and one Full Application for consideration under TA 1. If an applicant submits more than one Concept Paper or Full Application, EERE will only consider the last timely submission for evaluation. Any other submissions received listing the same applicant will be considered noncompliant and not eligible for further consideration. This limitation does not prohibit an applicant from collaborating on other applications (e.g., as a potential Subrecipient or partner) so long as the entity is only listed as the prime applicant on one Concept Paper and Full Application submitted under this FOA.

Topic Area 2
Applicants may submit multiple concept papers and full applications. Each application must cover a significantly distinct technology. Each Concept Paper and Full Application must address no more than one of the four focus areas identified in Section I.B of this FOA.

K. QUESTIONS REGARDING ELIGIBILITY

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

VI. APPLICATION AND SUBMISSION INFORMATION

- **APPLICATION PROCESS**

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

The Concept Paper, Full Application, and Reply to Reviewer Comments must conform to the following requirements:

- Each must be submitted in Adobe PDF format unless stated otherwise.
- Each must be written in English.
- All pages must be formatted to fit on 8.5 x 11 inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font color, and a font size of 12 point or larger (except in figures or tables, which may be 10 point font). A symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement.

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

Applicants are responsible for meeting each submission deadline. **Applicants are strongly encouraged to submit their Concept Papers and Full Applications at least 48 hours in advance of the submission deadline**. Under normal conditions (i.e., at least 48 hours in advance of the submission deadline), applicants should allow at least 1 hour to submit a Concept Paper, Full Application, or Reply to Reviewer Comments. Once the Concept Paper, Full Application, or Reply to Reviewer Comments is submitted in EERE Exchange, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made, the applicant must resubmit the Concept Paper, Full Application, or Reply to Reviewer Comments before the applicable deadline.

EERE urges applicants to carefully review their Concept Papers and Full Applications and to allow sufficient time for the submission of required information and documents. All Full Applications that pass the initial eligibility review will undergo comprehensive technical merit review according to the criteria identified in Section V.A.2 of the FOA.

ADDITIONAL INFORMATION ON EERE EXCHANGE

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

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

Applicants that experience issue with submissions that result in late submissions: In the event that an applicant experiences technical difficulties so severe that they are unable to submit their application by the deadline, the applicant should contact the Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The Exchange helpdesk and/or the EERE Exchange system administrators will assist the applicant in resolving all issues (including finalizing submission on behalf of and with the applicant's concurrence). PLEASE NOTE, however, those applicants who are unable to submit their application on time due to their waiting until the last minute when network traffic is at its heaviest to submit their materials will not be able to use this process.

L. APPLICATION FORMS

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

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA, it must be broken into parts and denoted to that effect. For example:
ControlNumber_LeadOrganization_Project_Part_1
ControlNumber_LeadOrganization_Project_Part_2, etc.

M. CONTENT AND FORM OF THE CONCEPT PAPER

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

CONCEPT PAPER CONTENT REQUIREMENTS

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

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

The Concept Paper must conform to the following content requirements:

SECTION	PAGE LIMIT	DESCRIPTION
Cover Page	1 page maximum	The cover page should include the project title, the specific FOA Topic Area being addressed, both the technical and business points of contact, names of all team member organizations, and any statements regarding confidentiality.
Technology Description	3 pages maximum	Applicants are required to describe succinctly: 1. The proposed technology, including its basic operating principles and how it is unique and innovative; 2. The proposed technology's target level of performance (applicants should provide technical data or other support to show how the proposed target could be met); 3. The current state-of-the-art in the relevant field and application, including key shortcomings, limitations, and challenges; 4. How the proposed technology will overcome the shortcomings, limitations, and challenges in the relevant field and application; 5. The potential impact that the proposed project would have on the relevant field and application;

		6. The key technical risks/issues associated with the proposed technology development plan; and 7. The impact that EERE funding would have on the proposed project.
Addendum	2 pages maximum	Applicants are required to describe succinctly the qualifications, experience, and capabilities of the proposed Project Team, including: • Whether the Principal Investigator (PI) and Project Team have the skill and expertise needed to successfully execute the project plan; • Whether the applicant has prior experience which demonstrates an ability to perform tasks of similar risk and complexity; • Whether the applicant has worked together with its teaming partners on prior projects or programs; and • Whether the applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how it intends to obtain access to the necessary equipment and facilities. Applicants may provide graphs, charts, or other data to supplement their Technology Description.

EERE makes an independent assessment of each Concept Paper based on the criteria in Section V.A.1 of the FOA. EERE will encourage a subset of applicants to submit Full Applications. Other applicants will be discouraged from submitting a Full Application. An applicant who receives a "discouraged" notification may still submit a Full Application. EERE will review all eligible Full Applications. However, by discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project in an effort to save the applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

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

N. CONTENT AND FORM OF THE FULL APPLICATION

Applicants must submit a Full Application by the specified due date and time to be considered for funding under this FOA. Applicants must complete the following application forms found on the EERE Exchange website at https://eere-Exchange.energy.gov/, in accordance with the instructions.

Applicants will have approximately 30 days from receipt of the Concept Paper Encourage/Discourage notification to prepare and submit a Full Application. Regardless of the date the applicant receives the Encourage/Discourage notification, the submission deadline for the Full Application remains the date and time stated on the FOA cover page.

All Full Application documents must be marked with the Control Number issued to the applicant.

FULL APPLICATION CONTENT REQUIREMENTS

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

Each Full Application shall be limited to a single concept or technology. Unrelated concepts and technologies shall not be consolidated in a single Full Application.

Full Applications must conform to the following requirements:

SUBMISSION	COMPONENTS	FILE NAME
Full Application (PDF, unless stated otherwise)	Technical Volume (See Chart in Section IV.D.2)	ControlNumber_LeadOrganization_Technical Volume
	Statement of Project Objectives (EERE 303) (Microsoft Word format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_SOPO
	SF-424	ControlNumber_LeadOrganization_App424
	Budget Justification (EERE 335) (Microsoft Excel format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_Budget_Justification
	Summary for Public Release (1 page limit)	ControlNumber_LeadOrganization_Summary
	Summary Slide (1 page limit, Microsoft PowerPoint format)	ControlNumber_LeadOrganization_Slide
	Subaward Budget Justification (EERE 335) (Microsoft Excel format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_Subawardee_Budget_Justification
	Budget for FFRDC, if applicable	ControlNumber_LeadOrganization_FWP
	Authorization from cognizant Contracting Officer for FFRDC (if applicable)	ControlNumber_LeadOrganization_FFRDCAuth
	SF-LLL Disclosure of Lobbying Activities	ControlNumber_LeadOrganization_SF-LLL
	Foreign Entity and Performance of Work in the United States waiver requests (if applicable)	ControlNumber_LeadOrganization_Waiver
	U.S. Manufacturing Plans	ControlNumber_LeadOrganization_USMP
	Data Management Plan (TA 1 only) (Microsoft Word format)	ControlNumber_LeadOrganization_DMP
	Proof of Financial Viability (TA 1 only)	ControlNumber_LeadOrganization_FinV
	Risk Management Checklist (TA 1 only)	ControlNumber_LeadOrganization_RiskCheck
	Risk Register (TA 1 only) (Microsoft Excel format)	ControlNumber_LeadOrganization_RiskReg
	MHK Cost and Performance Template (TA 1 only) (Microsoft Excel format)	ControlNumber_LeadOrganization_LCOE
	MHK Cost and Performance Template Supporting Documentation (TA 1 only)	ControlNumber_LeadOrganization_LCOEDoc

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA it must be broken into parts and denoted to that effect. For example:

ControlNumber_LeadOrganization_TechnicalVolume_Part_1
ControlNumber_LeadOrganization_TechnicalVolume_Part_2, etc.

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

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

TECHNICAL VOLUME

The Technical Volume must be submitted in Adobe PDF format. The Technical Volume must conform to the following content and form requirements, including maximum page lengths. If applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages. This volume must address the Merit Review Criteria as discussed in Section V.A.2 of the FOA. Save the Technical Volume in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_TechnicalVolume".

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

The Technical Volume to the Full Application may not be more than 25 pages, including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all of the information in the table below. The applicant should consider the weighting of each of the evaluation criteria (see Section V.A.2 of the FOA) when preparing the Technical Volume.

SECTION/PAGE LIMIT	DESCRIPTION
Cover Page	The cover page should include the project title, the specific FOA Topic Area and focus area being addressed, both the technical and business points of contact, names of all team member organizations, and any statements regarding confidentiality.

Project Overview (This section should constitute approximately 10% of the Technical Volume)	The Project Overview should contain the following information: • Background: The applicant should discuss the background of their organization, including the history, successes, and current research and development status (i.e., the technical baseline) relevant to the technical topic being addressed in the Full Application. • Project Goal: The applicant should explicitly identify the targeted improvements to the baseline technology and the critical success factors in achieving that goal. • DOE Impact: The applicant should discuss the impact that DOE funding would have on the proposed project. Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.
Technical Description, Innovation, and Impact (This section should constitute approximately 30% of the Technical Volume)	The Technical Description should contain the following information: • Relevance and Outcomes: The applicant should provide a detailed description of the technology, including the scientific and other principles and objectives that will be pursued during the project. This section should describe the relevance of the proposed project to the goals and objectives of the FOA, including the potential to meet specific DOE technical targets or other relevant performance targets. The applicant should clearly specify the expected outcomes of the project. <u>TA 1 Specific Requirements:</u> o Discussion of required system scale: TA 1 fabrication and testing activities must be performed at full-scale. For purposes of TA 1, full-scale is defined as the device scale that is appropriate for early grid connected commercial deployments. Applicants should provide any information that is necessary to credibly demonstrate the proposed project meets this definition of full-scale. o Grid Connection: Connection to the electrical grid is not required for TA 1 projects. o Discussion of broad applicability: If applicable, the applicant should describe how the work scope has the potential to benefit multiple marine energy systems and/or technology types. • Feasibility: The applicant should demonstrate the technical feasibility of the proposed technology and capability of achieving the anticipated performance targets, including a description of previous work done and prior results. <u>TA 1 Specific Requirements:</u> o Discussion of technology development status: Applicants must provide information that demonstrates that they have (1) previously developed an advanced technology specifically for applications in wave or current energy conversion systems, (2) developed the advanced hardware or software technology and the full system design to at least TRL 5/6 (i.e., laboratory tested

	and validated model scale prototype component/process), and (3) modeled the energy conversion system in question using numerical simulations or laboratory tests to demonstrate system performance in operational and survival (i.e. extreme) conditions. • Innovation and Impacts: The applicant should describe the current state of the art in the applicable field, the specific innovation of the proposed technology, the advantages of proposed technology over current and emerging technologies, and the overall impact on advancing the state of the art/technical baseline if the project is successful. <u>TA 1 Specific Requirements:</u> o Discussion of commercial viability: The applicants must provide information that (1) demonstrates their technology development pathway towards achieving an LCOE of 15 c/kWh by 2030, (2) describes how the tasks in the proposed project align with a logical MHK system development pathway, (3) describes how the proposed work scope will lead to significant LCOE and AEP improvements (with reference to information provided in the MHK Cost and Performance Template as applicable) over a defensible baseline value and quantify improvements by completing the "baseline value" and "target value at completion of project" columns of the Metrics Table in the MHK Cost and Reporting Template, and (4) credibly demonstrates that the applicant is developing a technology with the ultimate commercial goal of delivering electricity to a grid.
Workplan and Market Transformation Plan (This section should constitute approximately 40% of the Technical Volume)	The Workplan should include a summary of the Project Objectives, Technical Scope, Work Breakdown Structure, Milestones, Go/No-Go Decision Points, and Project Schedule. A detailed Statement of Project Objectives (SOPO) is separately requested. The Workplan should contain the following information: • Project Objectives: The applicant should provide a clear and concise (high-level) statement of the goals and objectives of the project as well as the expected outcomes. • Technical Scope Summary: The applicant should provide a summary description of the overall work scope and approach to achieve the objective(s). The overall work scope is to be divided by performance periods that are separated by discrete, approximately annual decision points (see below for more information on go/no-go decision points). The applicant should describe the specific expected end result of each performance period. • Work Breakdown Structure (WBS) and Task Description Summary: The Workplan should describe the work to be accomplished and how the applicant will achieve the milestones, will accomplish the final project goal(s), and will produce all deliverables. The Workplan is to be structured with a hierarchy of performance period (approximately

annual), task and subtasks, which is typical of a standard work breakdown structure (WBS) for any project. The Workplan shall contain a concise description of the specific activities to be conducted over the life of the project. The description shall be a full explanation and disclosure of the project being proposed (i.e., a statement such as "we will then complete a proprietary process" is unacceptable). It is the applicant's responsibility to prepare an adequately detailed task plan to describe the proposed project and the plan for addressing the objectives of this FOA. The summary provided should be consistent with the SOPO. The SOPO will contain a more detailed description of the WBS and tasks.

- Milestone Summary: The applicant should provide a summary of appropriate milestones throughout the project to demonstrate success, where success is defined as technical achievement rather than simply completing a task. To ensure that milestones are relevant, applicants should follow the SMART rule of thumb, which is that all milestones should be **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**imely. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one milestone per quarter for the duration of the project (depending on the project, more milestones may be necessary to comprehensively demonstrate progress). The applicant should also provide the means by which the milestone will be verified. The summary provided should be consistent with the Milestone Summary Table in the SOPO.
- Go/No-Go Decision Points: The applicant should provide a summary of project-wide go/no-go decision points at appropriate points in the Workplan. A go/no-go decision point is a risk management tool and a project management best practice to ensure that, for the current phase or period of performance, technical success is definitively achieved and potential for success in future phases or periods of performance is evaluated, prior to actually beginning the execution of future phases. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one project-wide go/no-go decision point for each budget period (12 to 18-month period) of the project. The Applicant should also provide the specific technical criteria to be used to make the go/no-go decision. The summary provided should be consistent with the SOPO.
- Project Schedule (Gantt Chart or similar): The applicant should provide a schedule for the entire project, including task and subtask durations, milestones, and go/no-go decision points.
- Project Management: The applicant should discuss the team's proposed management plan, including the following:
    - The overall approach to and organization for managing the work
    - The roles of each Project Team member
    - Any critical handoffs/interdependencies among Project Team members
    - The technical and management aspects of the management plan, including systems and practices, such as financial and project management practices
    - The approach to project risk management
    - A description of how project changes will be handled

	○ If applicable, the approach to Quality Assurance/Control ○ How communications will be maintained among Project Team members • Market Transformation Plan: The applicant should provide a market transformation plan, including the following: ○ Identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including a mitigation plan ○ Identification of a product development and/or service plan, commercialization timeline, and financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, data dissemination, U.S. manufacturing plan etc., and product distribution.
Technical Qualifications and Resources (Approximately 20% of the Technical Volume)	The Technical Qualifications and Resources should contain the following information: • Describe the Project Team's unique qualifications and expertise, including those of key Subrecipients. • Describe the Project Team's existing equipment and facilities that will facilitate the successful completion of the proposed project; include a justification of any new equipment or facilities requested as part of the project. TA 1 Specific Requirements: ○ Discussion of testing location: The applicant must describe where the open water testing will be performed and include a discussion of how required permitting activities will be performed during the period of performance. ○ If the applicant proposes to test outside of the United States, justification for why the work cannot be successfully performed in the U.S. must be provided (also see Appendix C). • This section should also include relevant, previous work efforts, demonstrated innovations, and how these enable the applicant to achieve the project objectives. • Describe the time commitment of the key team members to support the project. • Attach one-page resumes for key participating team members as an appendix. Resumes do not count towards the page limit. Multi-page resumes are not allowed. • Describe the technical services to be provided by DOE/NNSA FFRDCs, if applicable. For Topic Area 2 it is not necessary to list all technical services to be provided by PNNL.

	• Attach letters of commitment from all Subrecipient/third party cost share providers as an appendix. Letters of commitment do not count towards the page limit. • Attach any letters of support from partners/end users as an appendix (1 page maximum per letter). Letters of support do not count towards the page limit. • For multi-organizational or multi-investigator projects, describe succinctly: o The roles and the work to be performed by each PI and Key Participant; o Business agreements between the applicant and each PI and Key Participant; o How the various efforts will be integrated and managed; o Process for making decisions on scientific/technical direction; o Publication arrangements; o Intellectual Property issues; and o Communication plans

STATEMENT OF PROJECT OBJECTIVES

Applicants are required to complete a Statement of Project Objectives (SOPO). A SOPO template is available on EERE Exchange at https://eere-Exchange.energy.gov/. The SOPO, including the Milestone Table, must not exceed 10 pages when printed using standard 8.5 x 11 paper with 1" margins (top, bottom, left, and right) with font not smaller than 12 point. Save the SOPO in a single Microsoft Word file using the following convention for the title "ControlNumber_LeadOrganization_SOPO". SOPOs for TA 1 applications are required to contain the Metrics Table presented the MHK Cost and Performance Template.

SF-424: APPLICATION FOR FEDERAL ASSISTANCE

Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms, under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period and not just the first project year, first phase or other subset of the project period. Save the SF-424 in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_App424".

BUDGET JUSTIFICATION WORKBOOK (EERE 335)

Applicants are required to complete the Budget Justification Workbook. This form is available on EERE Exchange at https://eere-Exchange.energy.gov/. Prime Recipients must complete each tab of the Budget Justification Workbook for the project as a whole, including all work to be performed by the Prime Recipient and its Subrecipients and Contractors, and provide all requested documentation (e.g., a Federally-approved rate agreement, vendor quotes).

Applicants should include costs associated with required annual audits and incurred cost proposals in their proposed budget documents. The "Instructions and Summary" included with the Budget Justification Workbook will auto-populate as the applicant enters information into the Workbook. Applicants must carefully read the "Instructions and Summary" tab provided within the Budget Justification Workbook. Save the Budget Justification Workbook in a single Microsoft Excel file using the following convention for the title "ControlNumber_LeadOrganization_Budget_Justification".

SUMMARY/ABSTRACT FOR PUBLIC RELEASE

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

SUMMARY SLIDE

Applicants are required to provide a single PowerPoint slide summarizing the proposed project. The slide must be submitted in Microsoft PowerPoint format. This slide is used during the evaluation process. Save the Summary Slide in a single file using the following convention for the title "ControlNumber_LeadOrganization_Slide".

The Summary Slide template requires the following information:

- A technology Summary;
- A description of the technology's impact;
- Proposed project goals;
- Any key graphics (illustrations, charts and/or tables);
- The project's key idea/takeaway;
- Project title, Prime Recipient, Principal Investigator, and Key Participant information; and
- Requested EERE funds and proposed applicant cost share.

SUBAWARD BUDGET JUSTIFICATION (EERE 335)

Applicants must provide a separate budget justification, EERE 335 (i.e., budget justification for each budget year and a cumulative budget) for each subawardee that is expected to perform work estimated to be more than $250,000 or 25 percent of the total work effort (whichever is

less). The budget justification must include the same justification information described in the "Budget Justification" section above. Save each subaward budget justification in a Microsoft Excel file using the following convention for the title "ControlNumber_LeadOrganization_Subawardee_Budget_Justification".

BUDGET FOR DOE/NNSA FFRDC (IF APPLICABLE)

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, the applicant must provide a DOE Field Work Proposal (FWP) in accordance with the requirements in DOE Order 412.1, Work Authorization System. DOE Order 412.1 and DOE O 412.1 (Field Work Proposal form) area available at the following link, under "DOE Budget Forms": https://www.directives.doe.gov/directives/0412.1-BOrder-a/view. Save the FWP in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_FWP".

AUTHORIZATION FOR NON-DOE/NNSA OR DOE/NNSA FFRDCS (IF APPLICABLE)

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

SF-LLL: DISCLOSURE OF LOBBYING ACTIVITIES

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

Prime Recipients and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (http://www.whitehouse.gov/sites/default/files/omb/grants/sflllin.pdf) if any non-Federal funds have been paid or will be paid to any person for influencing or attempting to influence any of the following in connection with your application:

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

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

WAIVER REQUESTS: FOREIGN ENTITIES AND PERFORMANCE OF WORK IN THE UNITED STATES

A. Foreign Entity Participation:

As set forth in Section III.A.3, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix C lists the necessary information that must be included in a request to waive this requirement.

B. Performance of Work in the United States

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

U.S. MANUFACTURING COMMITMENTS

As part of the application, applicants are required to submit a U.S. Manufacturing Plan. The U.S. Manufacturing Plan represents the applicant's measurable commitment to support U.S. manufacturing as a result of its award.

The weight given to the U.S. Manufacturing Plans during the review and selection process varies based on the particular FOA. Applicants should review Section V.A.2 of this FOA to determine the weight given to the U.S. Manufacturing Plans under this FOA.

A U.S. Manufacturing Plan should contain the following or similar preamble: "If selected for funding, the applicant agrees to the following commitments as a condition of that funding:" and, after the preamble, the plan should include one or more specific and measureable commitments. For example, an applicant may commit particular types of products to be manufactured in the U.S. In addition to or instead of making a commitment tied to a particular product, the applicant may make other types of commitments still beneficial to U.S. manufacturing. An applicant may commit to a particular investment in a new or existing U.S. manufacturing facility, keep certain activities based in the U.S. (i.e., final assembly) or support a certain number of jobs in the U.S. related to the technology and manufacturing. For an applicant which is likely to license the technology to others, especially universities for which licensing may be the exclusive means of commercialization the technology, the U.S. manufacturing plan may indicate the applicant's plan and commitment to use a licensing strategy that would likely support U.S. manufacturing.

When an applicant that is a domestic small business, domestic educational institution, or nonprofit organization is selected for an award, the U.S. Manufacturing Plan submitted by the applicant becomes part of the terms and conditions of the award. The applicant/awardee may

request a waiver or modification of the U.S. Manufacturing Plan from DOE upon a showing that the original U.S. Manufacturing Plan is no longer economically feasible.

When an applicant that is a domestic large business is selected for an award, a class patent waiver applies as set forth in Section VIII. L. Under this class patent waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class patent waiver, a domestic large business must agree that any products embodying or produced through the use of an invention conceived or first actually reduced to practice under the award will be substantially manufactured in the United States, unless DOE agrees that the commitments proposed in the U.S. Manufacturing Plan are sufficient.

For other entity types that are selected for award, please see Section VIII.L regarding U.S. manufacturing commitments.

DATA MANAGEMENT PLAN

C. Topic Area 1

Applicants are required to submit a Data Management Plan with their Full Application. The Data Management Plan is a document that outlines the proposed plan for data sharing or preservation. Submission of a Data Management Plan with the Full Application is required; failure to submit a complete Data Management Plan may result in a determination of non-compliance for your Full Application. Guidance for preparing a Data Management Plan is included in Appendix D of the FOA

xviii. Topic Area 2

Applicants whose Full Applications are selected for award negotiations will be required to submit a Data Management Plan during the award negotiations phase. Guidance for preparing a Data Management Plan for Topic Area 2 awards will be provided upon notification of selection for award negotiations.

xix. Rights in Technical Data

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

"Limited Rights Data": The U.S. Government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.

Government rights in Technical Data Produced Under Awards: The U.S. Government normally retains unlimited rights in technical data produced under Government financial assistance

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

PROOF OF FINANCIAL VIABILITY (TOPIC AREA 1 ONLY)

Proof of financial viability including cost share, to demonstrate the applicant's ability to complete the project, must be provided with application materials. For public companies, this must include a Balance Sheet (B/S), Income Statement (I/S), and Cash Flow Statement (CFS), which comprises the organization's Annual Report from latest quarter and the past 3 year(s) as available. For private companies, this must include statements prepared internally for tax purposes, etc. For both public and private companies, these documents must be certified by a CPA or other appropriate authority. DOE retains the right to retain independent financial consultant(s), or to use DOE personnel to analyze the information provided by the applicant. DOE also retains the right to complete additional/updated proof of financial viability reviews during go/no-go stage gate reviews. The reviewers will not rate the financial viability, but simply provide an analysis of the financial viability of the applicant for consideration by the Selection Official. Please annotate this information as "Sensitive" or "Confidential", if necessary.

RISK MANAGEMENT CHECKLIST AND RISK REGISTER (TOPIC AREA 1 ONLY)

Applicants should review the "Marine and Hydrokinetic Technology Development Risk Management Framework" (http://www.nrel.gov/docs/fy15osti/63258.pdf) and submit the Risk Management Checklist (Appendix A in the "Marine and Hydrokinetic Technology Development Risk Management Framework") with their application. In addition, applicants should populate the Risk Register (http://www.nrel.gov/docs/fy15osti/63258_template.xlsx) document with their top 10 expected project risks and submit the Risk Register with their application.

MHK COST AND PERFORMANCE TEMPLATE (TOPIC AREA 1 ONLY)

Applicants must complete the MHK Cost and Performance Template for the baseline (i.e. their technology before TA 1 work scope is completed) and improved technology (i.e. technology after TA 1 work scope is complete) at full-scale for a single device and an array. The MHK Cost and Performance Template is available on EERE Exchange at https://eere-Exchange.energy.gov/ and detailed instructions for how to complete the template are available in the template. The template includes fields to demonstrate the anticipated LCOE improvements that will be achieved within the work scope of TA 1 projects. This template will inform the Special Purpose LCOE Review described in Appendix E.

MHK COST AND PERFORMANCE TEMPLATE SUPPORTING DOCUMENTATION (TOPIC AREA 1 ONLY)
Applicants should provide any documentation that they feel is needed to support the information delivered in the MHK Cost and Performance Template. Examples of documentation that could be included are descriptions of the methods used to estimate device power capture and methods used to estimate the cost of various system components. In order to determine what supporting information is relevant, Applicants are encouraged to review both the written and slide-format DOE LCOE guidance documentation (http://en.openei.org/community/document/mhk-lcoe-reporting-guidance-draft). This supporting documentation will inform the Special Purpose LCOE Review described in Appendix E. Please annotate information as "Sensitive" or "Confidential", as necessary.

D. CONTENT AND FORM OF REPLIES TO REVIEWER COMMENTS

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

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

Replies to Reviewer Comments must conform to the following content and form requirements, including maximum page lengths, described below. If a Reply to Reviewer Comments is more than three pages in length, EERE will review only the first three (3) pages and disregard any additional pages.

SECTION	PAGE LIMIT	DESCRIPTION
Text	2 pages max	Applicants may respond to one or more reviewer comments or supplement their Full Application.
Optional	1 page max	Applicants may use this page however they wish; text, graphs, charts, or other data to respond to reviewer comments or supplement their Full Application are acceptable.

E. Post-Award Information Requests

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

- Indirect cost information
- Other budget information
- Commitment Letters from Third Parties Contributing to Cost Share, if applicable
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Environmental Questionnaire
- Additional detail on LCOE analysis
- Additional technical details on the MHK technology or project

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

Each applicant (unless the applicant is an individual or Federal awarding agency that is excepted from those requirements under 2 CFR §25.110(b) or (c), or has an exception approved by the Federal awarding agency under 2 CFR §25.110(d)) is required to: (i) Be registered in the System for Award Management (SAM) at https://www.sam.gov before submitting its application; (ii) provide a valid Dun and Bradstreet Universal Numbering System (DUNS) number in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency. DOE may not make a Federal award to an applicant until the applicant has complied with all applicable DUNS and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a Federal award, the DOE may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

G. Submission Dates and Times

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

H. Intergovernmental Review

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

I. FUNDING RESTRICTIONS

ALLOWABLE COSTS

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

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

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

PRE-AWARD COSTS

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

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

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

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

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

EERE does not guarantee or assume any obligation to reimburse costs where the Prime Recipient incurred the costs prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the applicant is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Likewise, if a project is selected for negotiation of award, and the Prime Recipient elects to undertake

activities that are not authorized for Federal funding by the Contracting Officer in advance of EERE completing a NEPA review, the Prime Recipient is doing so at risk of not receiving Federal Funding and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override these NEPA requirements to obtain the written authorization from the Contracting Officer prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives.

PERFORMANCE OF WORK IN THE UNITED STATES

a. Requirement.

All work performed under EERE Awards must be performed in the United States unless a waiver is submitted and approved. This requirement does not apply to the purchase of supplies and equipment; however, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. The Prime Recipient must flow down this requirement to its Subrecipients.

b. Failure to Comply.

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

c. Waiver.

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

The applicant must demonstrate to the satisfaction of EERE that a waiver would further the purposes of the FOA and is in the economic interests of the United States. EERE may require additional information before considering a waiver request. Save the waiver request(s) in a single PDF file titled “ControlNumber_PerformanceofWork_Waiver”. The applicant does not have the right to appeal EERE’s decision concerning a waiver request.

The Waiver should specifically describe why the testing activities proposed cannot be successfully completed within the United States and how the testing activities will benefit future commercial scale deployments in the US.

CONSTRUCTION

Recipients are required to obtain written authorization from the Contracting Officer before incurring any major construction costs.

FOREIGN TRAVEL

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

EQUIPMENT AND SUPPLIES

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

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

LOBBYING

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

Recipients and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (http://www.whitehouse.gov/sites/default/files/omb/grants/sflllin.pdf) if any non-Federal funds have been paid or will be paid to any person for influencing or attempting to influence any of the following in connection with your application:

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

RISK ASSESSMENT

Prior to making a Federal award, the DOE is required by 31 U.S.C. 3321 and 41 U.S.C. 2313 to review information available through any OMB-designated repositories of government-wide

eligibility qualification or financial integrity information, such as SAM Exclusions and "Do Not Pay."

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

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

VII. APPLICATION REVIEW INFORMATION

- Technical Review Criteria

CONCEPT PAPERS

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

Concept Paper Criterion: Overall FOA Responsiveness and Viability of the Project (Weight: 100%)

- The applicant clearly describes the proposed technology, describes how the technology is unique and innovative, and how the technology will advance the current state-of-the-art.
- The applicant has identified risks and challenges, including possible mitigation strategies, and has shown the impact that EERE funding and the proposed project would have on the relevant field and application;
- The applicant has the qualifications, experience, capabilities and other resources necessary to complete the proposed project; and
- The proposed work, if successfully accomplished, would clearly meet the objectives as stated in the FOA.

FULL APPLICATIONS

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

TOPIC AREA 1 FULL APPLICATION TECHNICAL REVIEW CRITERIA:

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

Technical Merit and Innovation

- Technology development status:
    - Degree to which the applicant has previously developed an advanced hardware and/or software technology specifically for applications in wave or current energy conversion systems.
    - Degree to which the applicant proposes to use hardware or software technologies and full system designs that have been developed to at least TRL 5/6 (i.e. laboratory tested and validated model scale prototype component/process).
    - Degree to which the applicant has sufficiently modeled the energy conversion system in question using numerical simulations or laboratory tests in order to demonstrate system performance in operational and survival (i.e. extreme) conditions.
- Degree to which the applicant demonstrates the system they propose to test is a full-scale system.
- Extent to which the application demonstrates how the proposed work scope will advance the state of the art through the proposed work scope; and
- Sufficiency of technical detail in the application to assess whether the proposed work is scientifically meritorious, including relevant data, calculations and discussion of prior work in the literature with analyses that support the viability of the proposed work.

Impact of Technology Advancement

- Degree to which the work proposed in the application could potentially benefit the entire MHK industry.
- Degree to which the project supports the topic area objectives and target specifications and metrics.
- Commercial viability:
    - Degree to which the proposed project contributes toward MHK technologies achieving an LCOE of 15 c/kW-h by 2030.
    - Degree to which the proposed project is on a logical system development pathway.
    - Degree to which the project will make significant LCOE and AEP improvements over a defensible baseline value provided in the Metrics Table (see the MHK Cost and Performance Template) ,as documented in the MHK Cost and Performance Template (and supporting documentation), and as informed by the Special Purpose LCOE Assessment.
    - Successful demonstration by the applicant that the system is being developed for the purposes of delivering electricity to a grid.

Criterion 2: Project Research Plan (30%)

Research Approach, Workplan and SOPO

- Degree to which the approach and critical path have been clearly described and thoughtfully considered; and
- Degree to which the task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed Workplan and SOPO will succeed in meeting the project goals.

Identification of Technical Risks

- Discussion and demonstrated understanding of the key technical risk areas involved in the proposed work and the quality of the mitigation strategies to address them.
- Likelihood of project success as demonstrated by the risk register and risk management checklist.

Baseline, Metrics, and Deliverables

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

Market Transformation Plan

- Identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including mitigation plan; and
- Comprehensiveness of market transformation plan including but not limited to product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, Data Management Plan, U.S. manufacturing plan etc., and product distribution.

Criterion 3: Team and Resources (20%)

- The reasonableness of the budget (including cost share contributions) and spend plan for the proposed project and objectives.
- The capability of the Principal Investigator(s) and the proposed team to address all aspects of the proposed work with a high probability of success. The qualifications, relevant expertise, and time commitment of the individuals on the team;
- The sufficiency of the facilities to support the work;
- The degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further development and commercial deployment of the proposed technologies;
- The level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan.

TOPIC AREA 2 FULL APPLICATION TECHNICAL REVIEW CRITERIA:

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

Technical Merit and Innovation

1. Extent to which the proposed technology addresses specific technical criteria for the appropriate focus area as outlined in Table 3 and Table 4;
    - Extent to which the proposed technology or process is innovative and has the potential to advance the state of the art;
    - Degree to which the current state of the technology and the proposed advancement are clearly described;
    - Extent to which the application specifically and convincingly demonstrates how the applicant will move the state of the art to the proposed advancement; and
    - Sufficiency of technical detail in the application to assess whether the proposed work is scientifically meritorious and revolutionary, including relevant data, calculations, and discussion of prior work in the literature with analysis that supports the viability of the proposed work.
    - Extent to which the proposed technology will fill a critical technical gap and reduce costs associated with current MHK environmental monitoring technologies.
    - The degree to which the project addresses environmental monitoring issues of significant regulatory concern to the MHK industry

Impact of Technology Advancement

- How the project supports the topic area objectives and target specifications and metrics; and
- The potential impact of the project on advancing the state-of-the-art.

Criterion 2: Project Research Plan (30%)

Research Approach, Workplan and SOPO

- Degree to which the approach and critical path have been clearly described and thoughtfully considered; and
- Degree to which the task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed Workplan and SOPO will succeed in meeting the project goals.

Identification of Technical Risks

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

Baseline, Metrics, and Deliverables

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

Market Transformation Plan

- Identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including mitigation plan; and
- Comprehensiveness of market transformation plan including but not limited to product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, Data Management Plan, U.S. manufacturing plan etc., and product distribution.

Criterion 3: Team and Resources (20%)

- The capability of the Principal Investigator(s) and the proposed team to address all aspects of the proposed work with a high probability of success. The qualifications, relevant expertise, and time commitment of the individuals on the team;
- The degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further development and commercial deployment of the proposed technologies;
- The level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan; and
- The reasonableness of the budget and spend plan for the proposed project and objectives.

CRITERIA FOR REPLIES TO REVIEWER COMMENTS

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

J. STANDARDS FOR APPLICATION EVALUATION

Applications that are determined to be eligible will be evaluated in accordance with this FOA, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance," which is available at: http://energy.gov/sites/prod/files/meritrev.pdf.

K. OTHER SELECTION FACTORS

PROGRAM POLICY FACTORS

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

- The degree to which the proposed project, including proposed cost share, optimizes the use of available EERE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to commercialize energy or related technologies;
- Technical, financial, market, organizational, and environmental risks associated with the project;
- Whether the proposed project is likely to lead to increased employment and manufacturing in the United States;
- Whether the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty; and
- The degree to which the applicant has demonstrated they have sufficient funds or can raise sufficient funds to successfully compete the project
- The degree to which all awards made under this FOA exhibit geographic diversity.
- The degree to which all awards made under this FOA exhibit technological diversity.
- TA 1 only:
    - The percentage of the work scope being performed in the United States and the percentage of the budget being spent in the United States
- TA 2 only:
    - Where gaps in expertise of the prime recipient exist, the degree to which applicant utilizes teaming relationship with FFRDCs and other entities in order to ensure project team has the most relevant and robust expertise.

SPECIAL PURPOSE LEVELIZED COST OF ENERGY ASSESSMENT (TOPIC AREA 1 ONLY)

EERE will commission an independent Special Purpose Reviewer to perform a Levelized Cost of Energy Assessment. The reviewer will consider all FOA submission documents, with a focus on the MHK Cost and Performance Template and supporting documentation. The Special Purpose Reviewer will produce a report that will be distributed to the Selection Officials and Merit Review Committee for their use in the merit review process. More details on this review are provided in Appendix E.

L. EVALUATION AND SELECTION PROCESS

OVERVIEW

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

PRE-SELECTION INTERVIEWS

As part of the evaluation and selection process, EERE may invite one or more applicants to participate in Pre-Selection Interviews. Pre-Selection Interviews are distinct from and more formal than pre-selection clarifications (See Section V.D.3 of the FOA). The invited applicant(s) will meet with EERE representatives to provide clarification on the contents of the Full Applications and to provide EERE an opportunity to ask questions regarding the proposed project. The information provided by applicants to EERE through Pre-Selection Interviews contributes to EERE's selection decisions.

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

EERE will not reimburse applicants for travel and other expenses relating to the Pre-Selection Interviews, nor will these costs be eligible for reimbursement as pre-award costs.

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

PRE-SELECTION CLARIFICATION

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

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

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

SELECTION

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

M. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

EERE anticipates notifying applicants selected for negotiation of award by Summer 2016 and making awards by Fall 2016.

VIII. AWARD ADMINISTRATION INFORMATION

- Award Notices

INELIGIBLE SUBMISSIONS

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

CONCEPT PAPER NOTIFICATIONS

EERE will notify applicants of its determination to encourage or discourage the submission of a Full Application. EERE will send a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE Exchange.

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

A notification letter encouraging the submission of a Full Application does not authorize the applicant to commence performance of the project. Please refer to Section IV.J.2 of the FOA for guidance on pre-award costs.

FULL APPLICATION NOTIFICATIONS

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

SUCCESSFUL APPLICANTS

Receipt of a notification letter selecting a Full Application for award negotiations does not authorize the applicant to commence performance of the project. If an application is selected for award negotiations, it is not a commitment by EERE to issue an award. Applicants do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the Prime Recipient in FedConnect.

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

Please refer to Section IV.J.2 of the FOA for guidance on pre-award costs.

ALTERNATE SELECTION DETERMINATIONS

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

UNSUCCESSFUL APPLICANTS

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

N. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Registration Requirements

There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected. These requirements are as follows:

xxi. EERE Exchange

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

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

xxii. DUNS Number

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

xxiii. System for Award Management

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

xxiv. FedConnect

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

xxv. Grants.gov

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

xxvi. Electronic Authorization of Applications and Award Documents

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

AWARD ADMINISTRATIVE REQUIREMENTS

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

FOREIGN NATIONAL ACCESS TO DOE SITES

All applicants that ultimately enter into an award resulting from this FOA will be subject to the following requirement concerning foreign national involvement. Upon DOE's request, Prime Recipients must provide information to facilitate DOE's responsibilities associated with foreign national access to DOE sites, information, technologies, and equipment. A foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has not been naturalized under U.S. law. If the Prime Recipient or Subrecipients, contractors or vendors under the award, anticipate utilizing a foreign national person in the performance of an award, the Prime Recipient is responsible for providing to the Contracting Officer specific information of the foreign national(s) to satisfy compliance with all of the requirements for access approval.

SUBAWARD AND EXECUTIVE REPORTING

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

NATIONAL POLICY REQUIREMENTS

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

ENVIRONMENTAL REVIEW IN ACCORDANCE WITH NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

EERE's decision whether and how to distribute federal funds under this FOA is subject to the National Environmental Policy Act (42 USC 4321, *et seq.*). NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at http://nepa.energy.gov/.

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

For Topic Area 2 recipients, (1) NEPA consultation and biological information will be required even on work completed with PNNL at PNNL; and (2) recipients will be expected to cooperate both with DOE and PNNL in providing necessary documentations for NEPA reviews.

APPLICANT REPRESENTATIONS AND CERTIFICATIONS

xxvii. Lobbying Restrictions

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

xxviii. Corporate Felony Conviction and Federal Tax Liability Representations

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 definitions apply:

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

xxix. Nondisclosure and Confidentiality Agreements Representations

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

- It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contactors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

- It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:

''These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.''

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

STATEMENT OF FEDERAL STEWARDSHIP

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

intervention in usual circumstances to correct deficiencies that develop during the project; assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the project objectives have been accomplished.

STATEMENT OF SUBSTANTIAL INVOLVEMENT

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

1. EERE shares responsibility with the recipient for the management, control, direction, and performance of the Project.

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

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

4. EERE participates in major project decision-making processes.

INTELLECTUAL PROPERTY MANAGEMENT PLAN

Within 30 days of selection, and if requested by the Contracting Officer, applicants with one or more subrecipients must submit an executed IP Management Plan between the members of the consortia or team.

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

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

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

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

SUBJECT INVENTION UTILIZATION REPORTING

In order to ensure that Prime Recipients and Subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, EERE may require that each Prime Recipient holding title to a subject invention submit annual reports for 10 years from the date the subject invention was disclosed to EERE on the utilization of the subject invention and efforts made by Prime Recipient or their licensees or assignees to stimulate such utilization. The reports must include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Prime Recipient, and such other data and information as EERE may specify.

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.

REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The checklist can be accessed at http://energy.gov/sites/prod/files/2013/05/f0/Attch_FA_RepReqChecklist_COMBINED_FINAL_4-23-13%20%283%29_0.pdf.

GO/NO-GO REVIEW

Each project selected under this FOA will be subject to a periodic project evaluation referred to as a Go/No-Go Review. Federal funding beyond the Go/No Go decision point (continuation funding), is contingent on (1) the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority; (2) meeting the objectives, milestones, deliverables, and decision point criteria of recipient's approved project and

obtaining approval from EERE to continue work on the project; and (3) the submittal of required reports in accordance with the Statement of Project Objectives.

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

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

CONFERENCE SPENDING

The recipient shall not expend **any** funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed $20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

IX. QUESTIONS/AGENCY CONTACTS

Upon the issuance of a FOA, EERE personnel are prohibited from communicating (in writing or otherwise) with applicants regarding the FOA except through the established question and answer process as described below. Specifically, questions regarding the content of this FOA must be submitted to: MHKFOA1418@EE.DOE.GOV. Questions must be submitted not later than 3 business days prior to the application due date and time.

All questions and answers related to this FOA will be posted on EERE Exchange at: https://eere-exchange.energy.gov. **Please note that you must first select this specific FOA Number in order to view the questions and answers specific to this FOA**. EERE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

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

X. OTHER INFORMATION

1) FOA MODIFICATIONS

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

O. INFORMATIONAL WEBINAR

EERE will conduct one informational webinar during the FOA process. PNNL will also hold one webinar during the FOA process to provide an overview of their facilities and capabilities as they relate to Topic Area 2. The webinars will be held after the initial FOA release but before the due date for Concept Papers.

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

P. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

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

Q. COMMITMENT OF PUBLIC FUNDS

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

R. TREATMENT OF APPLICATION INFORMATION

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

Applicants should not include trade secrets or commercial or financial information that is privileged or confidential in their application unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the FOA. Applications containing trade secrets or commercial or financial information that is privileged or confidential, which the applicant does not want disclosed to the public or used by the

Government for any purpose other than application evaluation, must be marked as described in this section.

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

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

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

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

The above markings enable EERE to follow the provisions of 10 CFR 1004.11(d) in the event a Freedom of Information Act (FOIA) request is received for information submitted with an application. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under a FOIA request or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

Subject to the specific FOIA exemptions identified in 5 U.S.C. 552(b), all information submitted to EERE by a FOA applicant is subject to public release under the Freedom of Information Act, 5 U.S.C. §552, as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175. It is the applicant's responsibility to review FOIA and its exemptions to understand (1) what information may be subject to public disclosure and (2) what information applicants submit to the Government that are protected by law. In some cases, DOE may be unable to make an independent determination regarding which information submitted by an applicant is releasable and which is protected by an exemption. In such cases, DOE will consult with the applicant, in accordance with 10 C.F.R. §1004.11, to solicit the applicant's views on how the information should be treated.

S. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Go/No-Go Review and Peer Review, the Government may seek the advice of qualified non Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. 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.

T. Notice Regarding Eligible/Ineligible Activities

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

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

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

V. Notice of Potential Disclosure Under Freedom of Information Act

Applicants should be advised that identifying information regarding all applicants, including applicant names and/or points of contact, may be subject to public disclosure under the Freedom of Information Act, whether or not such applicants are selected for negotiation of award.

W. Requirement for Full and Complete Disclosure

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

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

X. RETENTION OF SUBMISSIONS

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

Y. TITLE TO SUBJECT INVENTIONS

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

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions.

- All other parties: The Federal Non-Nuclear Energy Act of 1974, 42. U.S.C. 5908, provides that the Government obtains title to new inventions unless a waiver is granted (see below).

- Class Patent Waiver: DOE has issued a class waiver that applies to this FOA. Under this class waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class waiver, a domestic large business must agree that any products embodying or produced through the use of a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States, unless DOE agrees that the commitments proposed in the U.S. Manufacturing Plan are sufficient.

- Advance and Identified Waivers: Applicants may request a patent waiver that will cover subject inventions that may be invented under the award, in advance of or within 30 days after the effective date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to EERE within the timeframes set forth in the award's intellectual property terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

- Determination of Exceptional Circumstances (DEC): Each applicant is required to submit a U.S. Manufacturing Plan as part of its application. If selected, the U.S. Manufacturing Plan shall be incorporated into the award terms and conditions for domestic small businesses and nonprofit organizations. DOE has determined that exceptional circumstances exist that warrants the modification of the standard patent rights clause for small businesses and non-profit awardees under Bayh-Dole to the extent necessary to implement and enforce the U.S. Manufacturing Plan. For example, the commitments and enforcement of a U.S. Manufacturing Plan may be tied to subject inventions. Any

Bayh-Dole entity (domestic small business or nonprofit organization) affected by this DEC has the right to appeal it.

Z. GOVERNMENT RIGHTS IN SUBJECT INVENTIONS

Where Prime Recipients and Subrecipients retain title to subject inventions, the U.S. Government retains certain rights.

GOVERNMENT USE LICENSE

The U.S. Government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world. This license extends to contractors doing work on behalf of the Government.

MARCH-IN RIGHTS

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

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

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

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

AA. RIGHTS IN TECHNICAL DATA

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

"Limited Rights Data": The U.S. Government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.

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

BB. COPYRIGHT

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

CC. PROTECTED PERSONALLY IDENTIFIABLE INFORMATION

In responding to this FOA, applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the application documents. These documents will be used by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) and EERE as:

Any information about an individual maintained by an agency, including but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an individual's identity, such as their name, social security number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual.

This definition of PII can be further defined as: (1) Public PII and (2) Protected PII.

Public PII: PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.

Protected PII: PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that applicants must not include in the files listed above to be evaluated by the Merit Review Committee. This list is not all inclusive.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

DD. ANNUAL COMPLIANCE AUDITS

If a for-profit entity is a Prime Recipient or Subrecipient and has expended $750,000 or more of DOE funds during the entity's fiscal year, an annual compliance audit performed by an independent auditor is be required. For additional information, please refer to 2 C.F.R. § 910.501 and Subpart F.

If an educational institution, non-profit organization, or state/local government is a Prime Recipient or Subrecipient and has expended $750,000 or more of Federal funds during the non-

Federal entity's fiscal year, then a single or program-specific audit is required. For additional information, please refer to 2 C.F.R. § 200.501 and Subpart F.

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

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

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

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. FFRDC costs must be included in Total Project Costs. Following is an example of how to calculate cost sharing amounts for a project with $1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

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

- Formula: Total Project Cost ($) minus Federal share ($) = Non-federal share ($)
  Example: $1,250,000 minus $1,000,000 = $250,000

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

What Qualifies For Cost Sharing

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

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

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

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

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

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

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

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

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

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

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

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

a. For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A–122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. FAR Subpart 31.2—Contracts with Commercial Organizations

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

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

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

(B) Valuing and documenting contributions

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

a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
b. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.

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

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

(4) Valuing property donated by third parties.

a. Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

b. Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

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

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

a. Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.

b. The basis for determining the valuation for personal services and property must be documented.

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

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

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

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

Each task must be calculated individually as follows:

Task 1
$1,000,000 divided by 80% = $1,250,000 (Task 1 Cost)
Task 1 Cost minus federal share = Non-federal share
$1,250,000 - $1,000,000 = $250,000 (Non-federal share)

Task 2
$500,000 divided 80% = $625,000 (Task 2 Cost)
Task 2 Cost minus federal share = Non-federal share
$625,000 - $500,000 = $125,000 (Non-federal share)

Task 3
$400,000 / 50% = $800,000 (Task 3 Cost)
Task 3 Cost minus federal share = Non-federal share
$800,000 - $400,000 = $400,000 (Non-federal share)

Task 4
Federal share = $100,000
Non-federal cost share is not mandated for outreach = $0 (Non-federal share)

The calculation may then be completed as follows:

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

Blended Cost Share %
Non-federal share ($775,000) divided by Total Project Cost ($2,775,000) = 27.9% (Non-federal)
Federal share ($2,000,000) divided by Total Project Cost ($2,775,000) = 72.1% (Federal)

APPENDIX C – WAIVER REQUESTS: FOREIGN ENTITY PARTICIPATION AS THE PRIME RECIPIENT AND PERFORMANCE OF WORK IN THE UNITED STATES

WAIVER FOR FOREIGN ENTITY PARTICIPATION AS THE PRIME RECIPIENT

As set forth in Section III.A.3, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Overall, the applicant must demonstrate to the satisfaction of EERE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to have a foreign entity serve as the Prime Recipient. A request to waive the *Foreign Entity Participation as the Prime Recipient* requirement must include the following:

- Entity name;
- The rationale for proposing a foreign entity to serve as the Prime Recipient;
- Country of incorporation;
- A description of the project's anticipated contributions to the U.S. economy;
    - How the project will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
    - How the project will promote domestic American manufacturing of products and/or services;
- A description of how the foreign entity's participation as the Prime Recipient is essential to the project;
- A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP;
- Countries where the work will be performed (Note: if any work is proposed to be conducted outside the U.S., the applicant must also complete a separate request for waiver of the Performance of Work in the United States requirement).

EERE may require additional information before considering the waiver request.

The applicant does not have the right to appeal EERE's decision concerning a waiver request.

WAIVER FOR PERFORMANCE OF WORK IN THE UNITED STATES

As set forth in Section IV.J, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit an explicit waiver request in the Full Application. A separate waiver request must be submitted for each entity proposing performance of work outside of the United States.

Overall, a waiver request must demonstrate to the satisfaction of EERE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to perform work outside of the United

States. A request to waive the *Performance of Work in the United States* requirement must include the following:

- The rationale for performing the work outside the U.S. ("foreign work");
- A description of the work proposed to be performed outside the U.S.;
- An explanation as to how the foreign work is essential to the project;
- A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the U.S. economy;
    - The associated benefits to be realized and the contribution to the project from the foreign work;
    - How the foreign work will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
    - How the foreign work will promote domestic American manufacturing of products and/or services;
- A description of the likelihood of Intellectual Property (IP) being created from the foreign work and the treatment of any such IP;
- The total estimated cost (DOE and Recipient cost share) of the proposed foreign work;
- The countries in which the foreign work is proposed to be performed; and
- The name of the entity that would perform the foreign work.

EERE may require additional information before considering the waiver request.

The applicant does not have the right to appeal EERE's decision concerning a waiver request.

APPENDIX D - DATA MANAGEMENT PLAN

A data management plan ("DMP") explains how data generated in the course of the work performed under an EERE 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.

In an effort to improve future data management and access, the Department of Energy's (DOE) Water Power Program launched a Marine in Hydrokinetics Data Repository (MHK-DR) to manage the receipt, protection, and dissemination of scientific and technical data generated by DOE funded awards.

EERE will collect a standard set of data on all projects for submission to the MHK-DR, including the following:

1. All reports as specified as deliverables in Statement of Project Objectives (SOPOs)
2. Peer/Program Review Presentation and Report;
3. Other reports as deemed necessary by HQ; and
4. Data (i.e., raw and/or post-processed data such as modeling results, map filters, analysis results) generated as a result of the applicants Research, Development, and Demonstration (RD&D) is to be structured (see https://mhkdr.openei.org/faq#fileformats) and uploaded to the DOE MHK-DR. If a DOE recommended Content Model exists for the research data generated as a result of the funded RD & D, the applicant will use the recommended Content Model to standardize the structured data. Where a Content Model does not exist, the applicant should upload the data in a structured format (where data can be easily entered, stored, queried and analyzed, such as Excel) using existing, accepted community standards. While the use of Content Models or structured data is preferred, unstructured data (i.e. word documents, video, photos, audio files, presentations, webpages, etc.…) is also acceptable.

   The Recipient must provide data to the DOE Marine and Hydrokinetic Data Repository (MHK-DR) as it is generated, but no later than the end of each reporting quarter in which the data is generated. The data will be submitted to the MHK-DR at http://mhkdr.openei.org. If the data is protected and thus subjected to a moratorium, it will not be made publicly available until the moratorium has expired, and it will be held in a secure section of the MH-KDR. All Data will be treated according to the Intellectual Property Provisions for the Award.

   The DMP must provide a plan to ensure all research data generated from the proposed work (including publications required within the scope of work, such as the final technical report, and beyond) is also digitally accessible via the MHK-DR, at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, data used to generate the displayed data (experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; image;

video; audio; and associated metadata) 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 (e.g. as part of the same MHK-DR data submission to the published article, or through other means. All published articles containing data generated from the proposed work should indicate that the data can be accessed via the MHK-DR.

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 should reference available information about the MHK Data Repository submission requirements (https://mhkdr.openei.org/faq) to be used in the course of proposed work.

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

Data Determination for a DMP

The Principal Investigator 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 and placed under a limited-time moratorium (referred to as “protected data”) and what types of data that DOE should be able to release immediately (referred to as “unlimited data”). Similarly, for data developed outside of the proposed work at private expense that will be used in the course of the proposed work, the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential (referred to as “limited rights data”). Any use of limited rights data or labeling of data as “protected data” must be consistent with the DMP Requirements noted above.

A table of data deliverables inclusive of all report deliverables must be provided in the DMP in the following format.

Table of deliverables, including but not limited to milestone verification deliverables and all data generated under award. Data produced under this Award will be treated according to the Intellectual Property Provisions.

Anticipated Completion (Quarter)	Task (# and Name)	Associated Milestone # if Applicable	Deliverable Type (Report, Presentation, Data (e.g. Drawing, image, time-series, input/output files, etc.)	Description of Deliverable or Data Content*	Data Format**	Protection (Unlimited, Protected, Limited)	Expected File Size	Special Requirements ***	Where to submit the deliverable (PMCD, MHK-DR, etc.)

* List data generated over course of proposed work. E.g. Milestone verification report; Risk Register; System specifications; Predicted material and manufacturing costs; CAD drawings; Actual Material and manufacturing costs; Measured performance; and comparisons against initial numerical model projections

** (See https://mhkdr.openei.org/faq#datatypes for examples); Content Models uploaded to the MHK-DR website should be used whenever possible. If not possible, then existing, accepted community standards should be used.

*** 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.

Additional 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.

Format: Note the rationale for the selection of appropriate standards. 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 Content Models and community standards are missing or inadequate, the DMP should propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

Sharing and Preservation: Note which data content will not be directly uploaded to the MHK-DR, rather will be accessible for download via a public website link to an alternative preservation platform. A description of the plans for data sharing and preservation. 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 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 if data preservation location is only linked from the MHK-DR and not directly uploaded to the MHK-DR 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, awardees 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 data management, processing, uploading and resources articulated in a DMP, such as the submission and curation of data to MHK-DR, must 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, EERE encourages the citation of publicly available datasets (i.e. the MHK-DR) within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, EERE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service. Once the MHK-DR is connected to OSTI in FY16, the MHK-DR will assign DOIs free of charge to appropriate data submissions. This is done as part of the curation process. The determination of the datasets submitted to the MHK-DR that will get a DOI will be made by OSTI.

Definitions

Data Management: The process of controlling the information generated during a RD&D project. How data is managed depends on the types of data involved, how data is collected and stored, and how it is used – throughout the project lifecycle.

Data Format: Preferred formats are those that contain standardized, structured data and support the best reusability. Ideally using the Content Models uploaded to the MHK-DR website would be the preferred format (see https://mhkdr.openei.org/models/). However, the MHK-DR will accept your data in whichever format you are able to provide it. If your data are in multiple formats, consider these data format guidelines. (See https://mhkdr.openei.org/faq#fileformats)

a. TIER 1: Good unstructured data
    i. PDF, PowerPoint, Image, etc.
b. TIER 2: Better structured data.
    i. Excel, CSV, XML, etc.
c. TIER 3: Best structured and standardized data
    i. Data or content model
    ii. Standardized Excel, CSV, XML, RDF, JSON, etc.

Content Model: Refers to a structured (e.g. Excel, CSV, XML) and standardized form developed by Department of Energy used to submit data. Content models are tools used to collect a subset of common data in a standardized form that allows quick data aggregations between projects. These Content models organize the data in a consistent manner, using standardized units, thereby allowing straightforward population and use.

Structured Data: Refers to data that resides in a fixed field within a record or file. This includes data contained in relational databases and spreadsheets (e.g. Excel, CSV, XML).

Unstructured Data: Refers to information that does not reside in a traditional row-column database. Unstructured data files often include e-mail messages, word processing documents, videos, photos, audio files, presentations, webpages and many other kinds of business documents.

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.

Research Data: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings. For DOE Water program awards, research data also includes development and demonstration data from RD&D projects. Includes numerical datasets, observational information, maps, texts, images, and time-dependent media, etc. Data are any and all complex data entities from observations, experiments, simulations, models, and higher order assemblies, along with the associated documentation needed to describe and interpret the data. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data. Does NOT include 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:

1. 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
2. Personnel and medical information and similar information the disclosure of which would constitute a clearly unwanted 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.

APPENDIX E – SPECIAL PURPOSE LCOE REVIEW

EERE will commission an independent Special Purpose Reviewer to review all FOA submission documents, with a focus on the MHK Cost and Performance Template and supporting documentation. The MHK Cost and Performance Template is available on EERE Exchange at https://eere-Exchange.energy.gov/ and detailed instructions for how to complete the template are available in the template. The Special Purpose Reviewer will produce a report that will be distributed to the Selection Officials and Merit Review Committee for use in the merit review process. The report will not rate or rank applicants, but will instead provide an analysis of completeness, transparency, and defensibility of the information provided in the FOA application. The focus of the Special Purpose Review will be to:

- Evaluate the completeness, transparency, and defensibility of the delivered MHK Cost and Performance Template and supporting documentation. This evaluation will focus particularly on:
    - The transparency and defensibility of component cost and device performance estimates delivered in the MHK Cost and Performance Template and supporting documentation.
    - The transparency and defensibility of how single device costs and performance are scaled to array scale.
    - The transparency and defensibility in the assumptions underlying the estimated LCOE reduction from applicants' proposed innovations.
- Evaluate the potential commercial viability of the technology and system in question by considering:
    - The degree to which the marine energy system has the potential to achieve an LCOE of 15 c/kWh by 2030.
    - The degree to which the project can help advance the entire marine energy industry towards achieving an LCOE of 15 c/kWh by 2030.
    - The degree to which the proposed project is on a logical system development pathway.
    - The degree to which the project will make significant and defensible LCOE and AEP improvements over a defensible baseline value provided in the MHK Cost and Performance Template.

Pending the identification of potentially outlying cost and performance assumptions, or major concerns in scaling and LCOE assumptions, the Special Purpose LCOE Review report may provide alternate estimates for the baseline LCOE and the improved LCOE after project completion. These alternate LCOE estimates will be considered by the Selection Official and Merit Reviewers, if applicable.