Water Power Technology Office (WPTO)

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

Marine and Hydrokinetic Technology Advancement and Data Dissemination - DE-FOA-0001837

MHKFOA@ee.doe.gov

FOA Webinar

DE-FOA-0001837

May 10, 2018

Notice

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

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

- Your participation is completely voluntary.

Anticipated Schedule

FOA Issue Date:	4/30/18
FOA Informational Webinar:	5/10/18
Submission Deadline for Concept Papers:	5/31/18, 5:00 ET
Submission Deadline for Full Applications:	7/17/18, 5:00 ET
Submission Deadline for Replies to Reviewer Comments:	8/22/18, 5:00 ET
Expected Date for EERE Selection Notifications:	September 2018
Expected Timeframe for Award Negotiations:	December 2018

Notice

- All applicants are strongly encouraged to carefully read the Funding Opportunity Announcement DE-FOA-0001837 **("FOA")** and adhere to the stated submission requirements.
- This presentation summarizes the contents of the FOA. If there are any inconsistencies between the FOA and this presentation or statements from DOE personnel, the FOA is the controlling document and applicants should rely on the FOA language and seek clarification from EERE.
- If you believe there is an inconsistency, please contact MHKFOA@ee.doe.gov

Agenda

1) FOA Description
2) Topic Areas/Technical Areas of Interest
3) Award Information
4) Statement of Substantial Involvement
5) Cost Sharing
6) Concept Papers
7) Full Applications
8) Merit Review and Selection Process
9) Registration Requirements

FOA Description

- Marine and Hydrokinetic (MHK) technologies are at an early stage of development due to the fundamental scientific and engineering challenges of generating power from dynamic, low velocity and high-density waves and currents, while surviving in corrosive ocean environments. Water Power Technologies Office's (WPTO) strategy to help catalyze MHK development focuses primarily on technology research and design tools to enable industry to reduce cost and improve performance of MHK technology concepts. WPTO also supports efforts to model and predict the environmental effects of marine energy devices through research that simulates device-ecosystem interactions and enables industry to develop new technologies that more accurately monitor devices in the water. WPTO research generates new data and synthesizes and disseminates existing data that would not otherwise be available to the MHK community, resource agencies, and regulators.

FOA Description: Objectives

1. Advance MHK technologies that will be ready for future testing and validation in open water test sites. Design development and scale testing will decrease system risks and validate numerical performance modeling.
2. Research PTO and controls concurrently to improve system performance.
3. Develop resources, activities, and methodologies to ensure that the most up-to-date scientific understanding of environmental impacts will inform and facilitate federal and state regulatory processes, with the ultimate aim of reducing the time and costs of permitting MHK devices.

FOA Description: Overview

This FOA announces DOE's intent to support MHK R&D projects in three Topic Areas:

(1) Early Stage Device Design Research,

(2) Controls and Power Take Off (PTO) Design Integration and Testing, and

(3) Dissemination of Environmental Data and Analyses to Facilitate the Marine Energy Regulatory Process.

Topic Area	Maximum of Awards	Period of Performance *(up to)*	Federal funding per award *(estimated)*	Cost Share
Topic 1: Early Stage Device Design Research	10	3 years	$500K-$3.5M	20%
Topic 2: Controls and Power Take Off Design Integration and Testing	6		$750K-$2.0M	
Topic 3: Dissemination of Environmental Data and Analyses to Facilitate the Marine Energy Regulatory Process	2		$800K-$1.6M	0%

Topic Area 1: Early Stage Device Design Research

The goal of this Topic Area is to provide funding support for early-stage development and evaluation of next generation wave and tidal/current systems. This topic will target high potential prototype scale systems which can be proven through numerical simulations and testing validation. Through various testing scenarios including lab, tank, and open water, projects will demonstrate that devices are capable of achieving high performance with a clear path forward towards testing larger-scale devices in relevant lab or open-water environments. Investments at these scales will advance a technological pipeline towards achieving cost competitiveness in maritime markets (i.e. non-grid), while working toward long-term cost-competitiveness at the utility scale.

Topic Area 1: Early Stage Device Design Research

The goals of this Topic Area are to support early-stage research to (1) design high techno-economic potential prototype next-generation wave and tidal/current systems, and (2) mature the readiness of the system designs for future larger scale testing.

- Projects must demonstrate that devices are capable of achieving and maintaining **techno-economic potential and design readiness** by meeting targeted goals relative to the baseline system as proposed by the technology developer and outline a clear path forward towards testing larger-scale devices in relevant open-water environments. During the period of performance, as the proposed technology matures, further innovation will be required to ensure the high techno-economic potential of the technology is maintained as it is scaled up and tested and sub-systems are integrated into a functional solution.

- Applicants must establish a baseline techno-economic potential and design readiness for their system. The application must demonstrate that preliminary design, numerical modeling, and, to the extent practical, scale testing validation has been completed.

Topic Area 1: Early Stage Device Design Research

Design readiness of the MHK technologies must be demonstrated in the application by a combination of the following readiness indicators:

- Prototype design with initial numerical performance modeling completed
- Hydrodynamic modeling completed
- Power capture modeling completed
- Applicant provided metric or readiness indicators tailored to the technology

Applicants should identify the standards based approach used that will lead to certification and eventual commercialization. They should also identify any long lead materials necessary for BP1 or anticipated to be necessary for BP2.

Topic Area 1: Early Stage Device Design Research

Techno-economic potential of the MHK technologies must be demonstrated in successful applications. The following metrics are required to establish the technology's potential (see Appendix E for more information):

- Levelized Cost of Energy (LCOE) and Levelized Cost of Water (LCOW) if applicable*
- Power to weight ratio
- Annual Energy Production (AEP)
- Peak to average absorbed power ratio
- Applicant proposed performance metrics tailored to the technology

**In the case of other technology applications, such as a desalination project, LCOW may be proposed as an additional metric.*

Topic Area 2: Controls and Power Take Off Design Integration

This Topic Area focuses on early-stage design of PTO and control systems in parallel. Past experience in controls implementation has shown that the best results are achieved by designing a PTO in conjunction with a control system. Significant improvements in costs and risks can be achieved by testing a functional PTO with control system in a laboratory setting at a sufficient scale such that test results can be scaled up to predict full scale performance. Design and development of prototype PTO and control systems will be conducted concurrently, and each will inform the other. PTOs will be built and tested with an operational real time control system at a relevant scale in a laboratory or other appropriate testing environment if sufficiently justified.

Topic Area 2: Controls and Power Take Off Design Integration

- There are a number of different ways PTO and controls research in parallel can improve system performance. Considering LCOE as an example, PTO and control system research can target increases in Annual Energy Production (AEP), reduction of Capital Expenditures (CapEx), and/or reduction of Operational Expenditures (OpEx). For instance, focus on load reduction or load shedding could reduce peak to average absorbed power ratio and increase reliability, both of which directly reduce CapEx and OpEx.

- If the applicant is not a device developer, they must team with an end use partner to define system requirements and integration considerations, where the PTO is directly intended for use in an existing MHK device. Applicants could also propose a crosscutting design to the extent feasible, provided they demonstrate that the PTO would be used in an MHK device ultimately intended for commercial application.

Topic Area 2: Controls and Power Take Off Design Integration

Applicants are required to use a minimum of four metrics, one of which must be LCOE, to evaluate technology advancement and project success. Additional metrics will be proposed by the applicant, allowing for flexibility in technology types, technology applications, and project approaches. Applicants should also briefly justify their choice of metrics to be targeted under the project, as it is intended that these metrics will prove useful to both DOE and the awardee as well as the broader industry. Additional metrics may include, but are not limited to the following metrics (see Appendix E for more information):

- LCOE (required) and Levelized Cost of Water (LCOW) if applicable
- Peak to average absorbed power ratio
- Controllability
- AEP
- Energy capture efficiency
- Load reduction
- Additional metrics may be proposed and justified by the applicant

Topic Area 3: Dissemination of Environmental Data and Analyses to Facilitate the Marine Energy Regulatory Process

- This Topic Area aims to increase regulatory familiarity with (1) the various types of MHK technologies and (2) the current scientific understanding of potential environmental impacts, with the ultimate goal of reducing time and costs for MHK device permitting processes. As the MHK industry is still in the early stages of development, relatively few MHK projects have gone through the entire permitting process. As a result, federal, state, and local regulators are not always familiar with the various MHK technologies, how they interact with the aquatic environment, and the relevant potential environmental risks associated with the technologies. Given limited resources, regulators may make decisions based on limited background information, which can result in a lengthy and costly regulatory and permitting process.

- While new research examining environmental concerns accumulates, it is critical that this information continues to be actively and effectively communicated to the regulatory community. This information can be incorporated into the permitting process in order to reduce the burden faced by technology developers looking to test prototype systems. Projects funded under TA 3 will leverage existing research, publications, reports, previous activities, events, and results to propose materials, activities, and methodologies that can ultimately inform and improve the process for permitting and licensing projects.

Topic Area 3: Dissemination of Environmental Data and Analyses to Facilitate the Marine Energy Regulatory Process

- **Specific Challenges:** Applicants should identify what they view as the most substantial challenges to having existing environmental information utilized in the permitting process. Consequently, applicants should explain how the proposed approach will address those specific challenges.
- **Target Audience:** The applicant should identify which specific federal/state/local regulatory agencies will be the target audience for the proposed activities.
- **Geographical Region(s):** Applicants should identify which geographical region(s) will be targeted for activities and provide rationale for why the regions were chosen.
- **Format:** Applicants should provide information on the format of the envisioned activities and deliverables (e.g. in-person meetings, webinars, etc.), and justification as to why the chosen formats are the most efficient or effective methods.
- **Content:** All activities should strive to increase regulators' familiarity with different MHK device types, how they interact with the marine environment, and the current state of scientific understanding regarding the most common environmental risks of MHK deployments. All applications should detail the specific content and sources of the content they intend to utilize.
- **Evaluation Method:** Applicants should provide details on the mechanism they intend to use to determine the efficacy of the planned activities, and how the results will be used to refine the methodology.
- **Deliverables/Reference Materials:** A considerable amount of time may pass between when regulators participate in the proposed activities and when they must evaluate and process a MHK application at their agencies. Additionally, staff turnover may results in new individuals joining a permitting process that is underway. As such, succinct, high-quality reference materials are imperative. Applicants should provide a detailed description of any reference materials or any other deliverable that will result from the project, their intended use, and their longevity. At the end of the project period, all created reference materials will be made publicly available on the Tethys database.

Award Information: Non-Responsive Applications

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

- Applications that fall outside the technical parameters specified in Section I and II of the FOA
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics)
- Applications that involve lobbying activities
- Applications considering energy conversion technologies that do not extract energy from waves, tides, river currents, or ocean currents

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

Topic Area 2: Applications that propose to address environmental/social barriers to open water testing

Topic Area 3: Applications that propose to conduct new environmental monitoring or research

Statement of Substantial Involvement

EERE has substantial involvement in work performed under Awards made following 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:

- EERE shares responsibility with the Recipient for the management, control, direction, and performance of the Project.
- 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.
- EERE may redirect or discontinue funding the Project, based on the outcome of EERE's evaluation of the Project at the Go/No Go decision point.
- EERE participates in major project decision-making processes.

Cost Sharing Requirements

Topic Areas 1 and 2: Cost Share 20%

- 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.)

Topic Area 3: Cost Share 0%

- Cost share is not required for education and information dissemination projects.

Cost Share Contributions

- Contributions must be:
  - Specified in the project budget
  - Verifiable from the Prime Recipient's records
  - Necessary and reasonable for proper and efficient accomplishment of the project
- 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

Allowable Cost Share

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

Entity	Cost Principles
For-profit entities	FAR Part 31
All other non-federal entities	2 CFR Part 200 Subpart E - Cost Principles

Allowable Cost Share

- Cash Contributions
  - May be provided by the Prime Recipient, Sub recipients, or a Third Party
- In-Kind Contributions
  - Can 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

Unallowable Cost Share

- The Prime Recipient may not use the following sources to meet its cost share obligations including, but not limited to:
  - Revenues or royalties from the prospective operation of an activity beyond the project period
  - Proceeds from the prospective sale of an asset of an activity
  - Federal funding or property
  - Expenditures reimbursed under a separate Federal Technology Office
  - Independent research and development (IR&D) funds
  - The same cash or in-kind contributions for more than one project or program

Cost Share Payment

- Recipients must provide documentation of the cost share contribution, incrementally over the life of the award
- The cumulative cost share percentage provided on each invoice must reflect, at a minimum, the cost sharing percentage negotiated
- In limited circumstances, and where it is in the government's interest, the EERE Contracting Officer may approve a request by the Prime Recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly. See Section III.B.vi of the FOA.

Concept Papers

- Applicants must submit a Concept Paper
  - Each Concept Paper must be limited to a single concept or technology
- The Concept Paper must include a technology description (See Section IV.C of the FOA)
  - The technology description is limited to 3 pages
  - The Concept Paper can also include graphs, charts, or other data (limited to 3 pages)
- Concept Papers must be submitted by 5/31/18, 5:00 pm ET, through EERE Exchange, and must comply with the content and form requirements in Section IV.C of the FOA
- EERE provides applicants with: (1) an “encouraged” or “discouraged” notification, and (2) the reviewer comments

Concept Paper Review

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

- The Full Application includes:
  - **Technical Volume**: The key technical submission - info relating to the technical content, project team members, etc..
  - **SF-424 Application for Federal Assistance:** The formal application signed by the authorized representative of the applicant.
  - **SF-424A Budget & Budget Justification:** a detailed budget and spend plan for the project.
  - **Summary for Public Release**
  - **Summary Slide**
  - **Calculation Addendum** (Topic Area 1 and Topic Area 2 only)
  - **Administrative Documents:** E.g., U.S. Manufacturing Plan, FFRDC Authorization (if applicable), Disclosure of Lobbying Activities, etc.

Full Applications: Technical Volume Content

Technical Volume: the key technical component of the Full Application

Content of Technical Volume	Suggested % of Technical Volume
Cover Page	
Project Overview	10%
Technical Description, Innovation and Impact	30%
Workplan and Market Transformation Plan	40%
Technical Qualifications and Resources	20%

Full Application Eligibility Requirements

- Applicants must submit a Full Application by 7/17/2018

- Full Applications are eligible for review if:
  - The Applicant is an eligible entity (Section III.A of FOA);
  - The Applicant submitted an eligible Concept Paper;
  - The Cost Share requirement is satisfied (Section III.B of FOA);
  - The Full Application is compliant (Section III.C of FOA); and
  - The proposed project is responsive to the FOA Section III.D of FOA
  - The Full Application meets any other eligibility requirements listed in Section III.E of the FOA.

Who's Eligible to Apply?

Eligible applicants for this FOA include:

1. Individuals
2. Domestic Entities
3. Foreign Entities
4. Incorporated Consortia
5. Unincorporated Consortia

For more detail about each eligible applicant, please see Section III.A of the FOA for eligibility requirements

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.

Who's Eligible to Apply?

DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) and DOE Government-Owned, Government-Operated laboratories (GOGOs) are not eligible to apply for funding as a Prime Recipient.

Non-DOE/NNSA FFRDCs 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.

Multiple Applications

Applicants may only submit one Full Application for each topic area of this FOA. If an applicant submits more than one Full Application to the same topic area, EERE will only consider the last timely submission for evaluation. Any other submissions received listing the same applicant for the same topic area 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 Full Application submitted under this FOA.

Merit Review and Selection Process: Full Applications

- The Merit Review process consists of multiple phases that each include an initial eligibility review and a thorough technical review
- Rigorous technical reviews 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, to make the selection decisions

Technical Merit Review Criteria

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

Technical Merit and Innovation

- Extent to which the proposed technology or process is innovative;
- 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 analyses that support the viability of the proposed work.

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.

Technical Merit Review Criteria - Continued

Criterion 2: Project Research and Market Transformation 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 mid-point deliverables defined in the application, such that meaningful interim progress will be made.

Technical Merit Review Criteria - Continued

Criterion 2, Continued

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.

Technical Merit Review Criteria - Continued

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 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; and
- The reasonableness of the budget and spend plan for the proposed project and objectives.

Replies to Reviewer Comments

- EERE provides applicants with reviewer comments
- Applicants are not required to submit a Reply - it is optional
- To be considered by EERE, a Reply must be submitted by 8/22/18, 5:00 pm ET and submitted through EERE Exchange
- Content and form requirements:

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.

Selection Factors

The Selection Official may consider the merit review recommendation, program policy factors, and the amount of funds available in arriving at selections for this FOA.

Program Policy Factors

- The Selection Official may consider the following program policy factors in making his/her selection decisions:
  - The degree to which the proposed project, 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, 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
  - The degree to which the proposed project directly addresses EERE's statutory mission and strategic goals

Registration Requirements

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

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

Means of Submission

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

Key Submission Points

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

Applicant Points-of-Contact

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

Questions

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

Thank you

The Water Power Technologies Office appreciates your interest in this funding opportunity!