

water

WPTO SBIR STTR Topics Webinar for FY22 Phase I

December 7, 2021

Webinar Logistics

- This webinar is being recorded and will be publicly posted.
- Attendees' microphones are muted and attendees are not visible on video.
- Questions are encouraged throughout the presentation.
- To ask questions:
 - Submit question into the chat box, ensuring that you are sending the question to “Everyone”
- If you have technical issues, try calling into the webinar via phone.

Agenda

- Remarks from EERE's Water Power Technologies Office (WPTO) Leadership
- Applying for SBIR/STTR Support
- FY 22 WPTO Phase I SBIR/STTR topics overview
 - **EERE Joint Topic: Community-Driven Solutions for a Just and Equitable Energy Transition (Topic 7b and 7d)**
 - **WPTO, WETO, AMO Joint Topic: Development of Cost Effective Wet-Mateable Connector Technologies (Topic 11a)**
 - **Cost Saving Innovations for Water Conveyance Systems for Powering Non-Powered Dams (Topic 18a)**
 - **Innovative Hydropower Technologies for Low Head (Less Than 30-ft.) (Topic 18b)**
 - **Innovations Accelerating Pumped Storage Hydropower Deployment (Topic 18c)**
 - **Co-Development of Marine Energy Technologies with End User Partners (CMET) (Topic 18d)**

A Word from Water Power Technologies Office Leadership

Key Dates

- Funding Opportunity Announcement Issued: Monday, December 13, 2021
- Funding Opportunity Webinar, December 17, 2021
- Letter of Intent Due Date: Monday, January 03, 2022
- Application Due Date: Monday, February 22, 2022
- Award Notification Date: Monday, May 16, 2021*
- Start of Grant: Monday, June 27, 2022*

* Subject to change

DOE SBIR/STTR Phase 0 Assistance Program

- For first time DOE SBIR/STTR Phase I participants; this program assists applicants at no charge how to provide responsive applications to the program
- Any first time STEM applicant is eligible to apply for the program
- DOE encourages women-owned, as well as socially and economic disadvantaged small business to take advantage of this service alongside those located in “under-represented states”.
- More information and how to apply:
<https://doephase0.dawnbreaker.com/apply/>

Technical and Business Assistance Program & American Made Network

Technical and Business Assistance Program (TABA, formerly Commercial Assistance Program)

- EERE is dedicated to the successful commercialization of SBIR/STTR funded technologies and can fund discretionary commercialization assistance for DOE SBIR and STTR Phase I awardees.
- Award recipients have two options for receiving commercialization assistance: (1) services provided by a DOE Vendor (Phase I only) or (2) identify their own commercialization assistance provider.
 - Information on the services provided via the DOE Vendor can be found at: <http://www.larta.org/doecap>
 - If you wish to utilize your own commercialization assistance provider, you are required to include this as a subcontract or consultant in your budget and to provide a detailed budget justification.
 - You may include up to \$6,500 for assistance in Phase I and up to \$50,000 in Phase II.

The American Made Network: A Resource for EERE-specific Commercialization Assistance

- The Network is comprised of National Labs, energy incubators, investors prototyping and testing facilities, and other industry partners from across the United States who engage, connect, mentor, and amplify the efforts of small businesses.
- Explore the Network to find potential partners and develop relationships at: <https://americanmadechallenges.org/network/>

Contracted Support through American Made Network Power Connectors



Matt Morris

matt@adlventures.com



Lynn Abramson

labramson@cebn.org



Cassie Coravos

ccoravos@entrepreneurfutures.org



Amanda Buchanan,

Amanda.buchanan635@gmail.com

- One of our Power Connectors, the Clean Energy Business Network, is hosting a webinar on teaming this afternoon 2:30-4:30 pm ET where you can learn more about the funding opportunity and network with prospective partners in an interactive platform.
- This Teaming Event is open to anyone with potential involvement in the SBIR/STTR landscape, including small businesses, university and corporate partners, engineering students, and contractors.
- Registration link: <https://secure.everyaction.com/DUCD3Wr-DEaZ1mynbSK9Qw2>

Resources

- Office hours
- Webinars
- Workshops
- Application Education



<https://app.box.com/s/ckh0d3e2lzufcu7lug8ki4u1c1hl4me3>



Energy I-Corps for SBIR/STTR

- The Energy I-Corps for SBIR/STTR program is designed to educate awardees on entrepreneurial concepts and practices
- EERE Phase I awardees are eligible to apply receive an intense 2-month entrepreneurial training from experienced instructors at no cost to participants.
 - **The training includes a series of interactive workshops and webinars focusing on performing customer discovery, identifying market segments, and crafting value propositions.**
- FY 2020 Phase I Release 2 awardee cycle was the first cohort for the program and DOE will continue the program in FY 2022.
- Participants will be selected based on their commitment statement on why I-Corps training will improve their commercialization efforts (in 150 words or fewer)
- Please note that time spent by the participants for the Energy I-Corps training cannot be directly billed to an SBIR/STTR award because these are not research and development expenses.



<https://science.osti.gov/sbir/Awardee-Resources/Energy-I-corps>

Other Important DOE SBIR/STTR Information

- DOE SBIR/STTR Phase I Proposal Prep Site
<https://science.osti.gov/SBIRLearning>
 - The DOE SBIR/STTR Phase I Proposal Prep site is available to help teach Small Businesses how to prepare a proposal in response to the DOE Funding Opportunity Announcement (FOA)
 - Includes text, audio, and video tutorials and other informational tools to help applicants learn about the program at no charge.

- Save the Date: FY 2022 SBIR/STTR Phase I FOA Webinar: Friday, December 17, 2021
 - Hosted by the DOE SBIR Office, topics to be covered include general SBIR/STTR application/award process and policies and general proposal preparation
 - Registration Information will be posted at a week before the webinar:
<https://science.osti.gov/sbir/Funding-Opportunities>

EERE Joint Topic: Community-Driven Solutions for a Just and Equitable Energy Transition

Topic 7b and 7g

Community-Driven Solutions for a Just and Equitable Energy Transition

Goals

- Develop equitable and inclusive innovative technology solutions for current and future energy challenges and needs, with communities / community organizations as partners
- This topic encourages small business technology developers from disadvantaged communities, and/or with extensive, substantive partnerships with disadvantaged communities
- Part of DOE's Justice40 Initiative
- Teaming opportunities facilitated at <https://www.energy.gov/eere/technology-to-market/broadening-participation-through-small-business-partnerships>

Successful applications will include:

- Technology subtopic and end-user community partner
- Structured program which includes technical milestones/timeline that demonstrate clear progress;
- Evidence that the team has sufficient experience, expertise, and/or capability in working in, or with disadvantaged communities;
- Identify the disadvantaged community organization partners;
- Thorough plan with the method and level of involvement from members of the disadvantaged community organization partner(s);
- Letter of support/commitment from the partnering community organization(s) towards participation in the project;
- Design package of proposed technology or deployment innovation;
- Clearly defined metrics and expected deliverables;
- Applications of project output and potential for future commercialization; •
- Include projections for cost and/or performance improvements that are tied to a clearly defined baseline and/or state of the art products or practices;
- Explicitly and thoroughly differentiate the proposed innovation with respect to existing commercially available products or solutions;
- An energy savings impact and impact grid as well as a preliminary cost analysis
- A plan to report all relevant performance metrics; and
- Justify all performance claims with theoretical predictions and/or relevant experimental data.
- **Applicants should demonstrate innovation in technology as well as community partnering.** The community engagement should be treated as an R&D component of the project, with a robust implementation and evaluation plan.

Community-Driven Solutions for a Just and Equitable Energy Transition

Subtopic 7b: Water Power Technologies Office

- Marine energy technologies, including tidal, current, and wave energy systems as well as ocean thermal energy conversion, suitable for microgrids and for remote, islanded, and isolated communities
- Hydropower technologies, including in small hydropower and low-impact hydropower growth, and new technology development for both existing water infrastructure and new stream-reach applications that incorporate ecological and social objectives

Subtopic 7g: Technology Solutions for Advancing Ocean Co-Existence and Co-Use with Marine Energy and Communities (Wind and Water)

- Applications for technology development that enhances understanding and improves co-location/multi-use management of ocean renewable energy development and other marine activities and end-user applications with a motivated purpose of serving disadvantaged communities.
- These may include communities co-located/or multi-use with potential marine energy sites. Co-location/multi-use is defined as an intentional joint use of space and resources by two or more users in close geographic proximity.
- Research topics should consider anthropogenic and environmental factors that influence multi-use potential.

Joint Topic: Development of Cost Effective Wet-Mateable Connector Technologies

Topic 11a

Development of Cost Effective Wet-Mateable Connector Technologies

Goal: To advance the state of the art and reduce life cycle costs of wet-mate connectors

Scope:

- Design, fabricate, test and certify a 11.4kV (WPTO) or 66kV (WETO) wet-mate connector
- WPTO requirement also includes operational testing in open water environment by partnering with a ME developer already funded to test their device in through a separate project
- Specifications should be based on the ME developer's technical requirements
- Design should be based on 25-year service life with periodic maintenance intervals as required
- Design should include sensors with fiber for remote monitoring iso maintenance planning
- Proposal should include innovative methodologies for connection/disconnection that minimize operating costs over the service life of the connector
- Proposals should increase reliability by using materials suitable for undersea harsh service conditions

Development of Cost Effective Wet-Mateable Connector Technologies

Deliverables

- Phase I (\$250k) final report:
 - Final design
 - Final cost estimates for fabrication and testing
 - Fabrication work plan
 - Lifecycle durability estimates
 - Testing and certification plan
- Phase II (\$1.6M) final report:
 - Certification data in accordance with international technical specification
 - Discussion of lessons learned with respect to design
 - Discussion of fabrication and testing challenges
 - Suggestions for future R&D efforts to improve wet-mate connector technologies
 - Lessons learned with respect to testing in the open water

Cost Saving Innovations for Water Conveyance Systems for Powering Non-Powered Dams

Topic 18a

Cost Saving Innovations for Water Conveyance Systems for Powering Non-Powered Dams

- Background
 - Non-Powered Dams contain a 12GW potential for hydropower development
 - Recent Oak Ridge National Laboratory work indicates that the water conveyance systems can be a major cost prohibitive factor for developing Non-Powered Dams
- Scope
 - Technological innovations leading to reduced costs and/or increased efficiencies with respect to typical industry practices of routing water to hydropower power generation components
 - Examples:
 - Reduced inlet/discharge losses
 - Innovative flow isolation technologies
 - Reduced friction losses
 - Increased functionality, debris and sediment passage

Cost Saving Innovations for Water Conveyance Systems for Powering Non-Powered Dams

- Phase I
 - Research, design, and develop innovative system for specific location or application
 - Illustrate integration of innovation into an existing water infrastructure such as Non-Powered Dams (NPD)
 - Describe how systems applies to specific type of dam or water conveyance
 - Perform a customer discovery to illustrate the potential for future commercialization
 - Determine suitable location for demonstration and obtain necessary permits
- Phase II
 - Perform demonstration of technology at phase I determined location
 - Develop detailed plan for commercialization
- Submissions to include
 - Discuss state-of-the-art for incumbent technologies
 - Communicate conceptual design using drawings or schematics
 - Detail steps and tasks to be performed in phase I & II

Innovative Hydropower Technologies for Low Head (Less Than 30-ft.)

Topic 18b

Innovative Hydropower Technologies for Low Head (Less Than 30-ft.)

- Background
 - Much of the existing infrastructure suitable for developing clean energy in the form of hydropower consists of less than 30-feet of head
 - Resulting in lower power densities and greater normalized costs for development
- Scope
 - Develop a cost-effective stand-alone minimum 50kW hydropower system, including necessary controls, for use independently and/or on small isolated grids, utilizing gross heads of 30 feet or less
 - Due to anticipated small scale, solutions need to be tightly coupled to end-user needs or clearly show how generated power will be utilized
 - PLEASE NOTE: Instream current, ocean current or tidal technologies are not of interest under this subtopic. For such technologies please see sub-topic 18.d
- Phase I
 - Type of resource targeted and intended deployment locations
 - Include regulatory, environmental, and social challenges
 - Methods for converting end-user needs into design requirements
 - Modularity and scalable aspects of the technology

Innovative Hydropower Technologies for Low Head (Less Than 30-ft.)

- Phase I contd.
 - Develop device operational criteria
 - Min/Max head, flow, and rating (kW)
 - Targeted Levelized Cost of Energy (LCOE) and materials for fabrications
- Phase II
 - Further research necessary to develop fully functional unit for testing
 - Fabrication and testing of prototype
 - Efforts to commercialize the technology
- Submissions to include
 - Discuss state-of-the-art for incumbent technologies
 - Detailed description of technology
 - Communicate conceptual design using drawings or schematics
 - Detail steps and tasks to be performed in phase I & II including commercialization efforts

Innovations Accelerating Pumped Storage Hydropower Deployment

Topic 18c

Innovations Accelerating Pumped Storage Hydropower Deployment

- Background: *What is the problem?*
 - Pumped storage hydropower (PSH) is presently the most mature long-duration energy storage (LDES) technology
 - In the US, little new PSH has been developed in past 20 years, due to development costs, revenue uncertainty, permitting challenges, and other factors
 - Rapid increase of LDES is necessary to accommodate variable renewables
- Scope: *What is an eligible innovation?*
 - Improves upon existing PSH in one (or more) of the following ways:
 - Reduced capital and/or O&M costs
 - Increased operational revenue and value to grid
 - Increased development and deployment speed
 - Reduced negative environmental and community impacts
 - Can address conventional PSH or alternative configurations
 - Can address specific component or full PSH system
 - Uses water to spin a pump/turbine

Innovations Accelerating Pumped Storage Hydropower Deployment

- Phase I
 - Analysis of how the innovation improves PSH's commercial potential
 - Detailed metrics quantifying improvement relative to state-of-the-art, including cost/kW, cost/kWh, and categories in Energy Storage Cost and Performance Database (Ref 6)
 - Constraints on where and how the innovation is deployable, with specific examples
 - Schematics and/or simulations illustrating technology's features and operating states
 - Planning for lab or field test in Phase II, including targets, budget, and partners
- Phase II
 - Laboratory or field test
 - Planning for full-scale demonstration, including targets, budget, partners, and policy
- Submissions should show:
 - How the innovation is improvement relative to state-of-the-art for existing technologies
 - How the system would operate, using conceptual designs/drawings/schematics

Co-Development of Marine Energy Technologies with End User Partners

Topic 18d

Co-Development of Marine Energy Technologies with End User Partners

- Part of WPTO's **Powering the Blue Economy (PBE)** initiative
- Co-develop marine energy solutions tightly coupled to end-user needs in the blue economy.
- Applicants may be technology developers and/or end users.
- **Market-agnostic topic**; applicants must include an initial analysis of market value and broader impact of their solution
- Successful applicants will include at least one end-user partner.
- Areas of interest beyond PBE applications can also include energy storage integration, technologies that harvest energy from instream/tidal current and water conveyances, such as irrigation canals and conduits, applications for promising early marine energy markets in coastal tourism and recreation



Co-Development of Marine Energy Technologies with End User Partners

Competitive applications for Phase I will demonstrate knowledge, experience, and/or capabilities in developing marine technologies and include:

- A sustainable business plan including target markets;
 - Plan to incorporate customer needs based on interviews, workshops, expert panels, literature searches, and other methods;
 - **Preliminary design** of the proposed system with estimated physical dimensions;
 - Clear description on **how the system would function**;
 - The **end-user** or customers engaged
 - Identification of the **marine energy resource** that would be utilized;
 - The **methods** by which customer needs will be converted into **design requirements or specifications**
 - Identification and description of the proposed **performance metrics** used to assess the system in comparison to incumbent technologies
- Relevance of this project to **DOE's climate change goals** including through advancing clean energy and decarbonization.
 - Description of how this project will support DOE's **climate and energy justice** goals;
 - Description of how this project will incorporate the needs and considerations of, and/or benefit of **disadvantaged communities**;
 - Description of **the intended deployment location(s)** and the **available energy** in the chosen marine energy resource, including identification of any key environmental, social, and regulatory challenges;
 - The state-of-the-art for incumbent technologies and **how the proposed design is an improvement** in performance or reduction in cost;
 - Details of work to be performed in Phase I including **resources required and intended performance targets**;
 - Initial **description of Phase II work** including the scale of the demonstration prototype, the intended test location or facility, and potential end-user partners.

Questions?

Please use the chat box



U.S. DEPARTMENT OF
ENERGY | *Office of* **ENERGY EFFICIENCY
& RENEWABLE ENERGY**
WATER POWER TECHNOLOGIES OFFICE

WPTO SBIR contact info

- WPTO SBIR Lead: Rajesh Dham, Rajesh.Dham@EE.Doe.Gov
 - EERE Joint Topic: Community-Driven Solutions for a Just and Equitable Energy Transition
 - WPTO, WETO, AMO Joint Topic: Development of Cost Effective Wet-Mateable Connector Technologies
 - Cost Saving Innovations for Water Conveyance Systems for Powering Non-Powered Dams (Hydropower)
 - Innovative Hydropower Technologies for Low Head (Less Than 30-ft.)
 - Innovations Accelerating Pumped Storage Hydropower Deployment
 - Co-Development of Marine Energy Technologies (CMET):
- For more information about WPTO's portfolio at large, please visit energy.gov/eere/water