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

Hydropower Laboratory Seedling Program
Request for Innovation (RFI)
Fiscal Year 2020

Hydropower Program
Water Power Technologies Office (WPTO)

Key Dates	
RFI Issue Date	March 20, 2020
Submission Deadline	May 1, 2020

Summary Information	
Means of Submission	Ideas should be submitted by email to miles.hall@ee.doe.gov
Purpose	Seeking ideas to pilot a hydropower seedling fund that would serve to support new and innovative ideas from DOE National Laboratories to inform WPTO Hydropower Program activities.
Questions	Questions about the submission process may be directed to Miles Hall (miles.hall@ee.doe.gov)

Section I: Description and Topic Areas

Background

WPTO's Hydropower Program conducts early-stage research and development (R&D) and applied science to further the development of transformative, cost-effective, and environmentally-sustainable hydropower and pumped storage technologies. While hydropower is an established technology with many commercially available components, there is significant opportunity for innovation to improve outcomes such as contributions to rapidly evolving power systems, multi-objective operations, and increased reliability. WPTO targets not only critical information and technology development challenges currently constraining hydropower value, but also research and analysis to improve understanding of any long-term costs—and potential solutions—associated with operating hydropower to maximize its contributions. The office also supports the use of hydropower to improve U.S. energy-water infrastructure and water security for the nation.

In support of advancing hydropower, WPTO plays an important role in offering competitive funding opportunities as well as encouraging collaborative research programs between different stakeholders. Programmatic investments typically focus on areas where industry is either unable or unlikely to independently supply private capital. Traditional funding opportunity announcements (FOAs), prizes, cooperative R&D agreements between National Laboratories and commercial entities, National Laboratory-led activities via Annual Operating Plan (AOP) agreements, and yearly small-business innovation research (SBIR/STTR) calls are some of the primary mechanisms with which WPTO supports National Laboratories, universities, and industry in conducting R&D.

This Request for Innovation (RFI) is being released to inform the development of the Hydropower Program's Laboratory Seedlings Pilot Program. Similar to the recent Marine Energy Laboratory Seedlings RFI, this effort seeks to provide a new avenue for funding creative ideas from the National Labs. The program seeks to support projects with sums up to $50,000 - $100,000, with 12 months or less work agreement. These projects would have the potential to inform future programmatic competitive solicitations, initiatives, and follow-on projects depending on outcomes. The goal of the Hydropower Seedlings Pilot Program is to encourage submission of new, creative, and diverse concepts from the labs that are not part of existing WPTO-funded projects, including developing technologies, fostering partnerships, or conducting analysis that can address mission critical goals.

If the ideas submitted seem promising, WPTO may follow up on some, none, or all of the submitted ideas, requesting a short statement of work and budget be drafted to execute on the idea(s).

Summary

The WPTO Hydropower Program has identified the following areas of opportunity for lab ideas. While the *Condition Monitoring* and *Data Analytics* areas are of interest to WPTO, there is also an *Open Area* to allow labs to submit research ideas that may be valuable and fall somewhat within the scope of WPTO Hydropower strategic approaches (attached).

Condition Monitoring

Effective asset management of hydropower facilities is increasingly data driven and empowers both locally-driven best practices as well as fleet-wide insights. One of the primary hurdles in this space is developing reliable, continuous, and consistent condition monitoring capabilities as this is typically done via inspection manuals that are highly subjective and of limited temporal resolution. In addition, there is the potential need to provide further insight into asset characteristics via the development of novel sensing techniques (given sufficient value proposition). Seedling concepts associated with this topic should be focused on changing the traditional paradigm and providing novel capabilities. Research in this space supports WPTO's efforts in Hydropower Upgrades and Modernization which is focused on developing capabilities for the hydropower industry to continue to provide value as the overall fleet ages and constraints on the energy-water system become more dynamic and restricted.

Data Analytics

The hydropower industry exists at the nexus of a complex landscape where data vary significantly in availability, resolution, and quality. In addition, given the number of sectors that hydropower affects or is affected by, including, but not limited to, basin-wide water/biological data, regulatory data, hydropower operational data, consolidation and processing of data across these sectors to provide actionable insights represents an opportunity for growth. In order for the hydropower industry to maximize its value proposition it is important to develop novel cross sector capabilities and data processing. Seedling concepts associated with this topic should be focused on improving existing paradigms or providing novel capabilities. This seedling topic is in support of WPTO's Big Data Access and Management efforts which are focused on articulating cross cutting data structures and leveraging broad datasets to provide unprecedented insights for the hydropower industry.

Open Area

WPTO also is looking for ideas that fall outside of the two previous listed areas.

Additional Questions - Optional

As a part of the research proposals the office is also hoping to solicit feedback on how the Seedlings process can be improved via the following questions. It should be noted that each lab only needs to answer these questions once.

1. How often should WPTO release a call for short-term projects?
2. What can WPTO do to increase the likelihood of attracting new ideas into the Seedling Program?

3. Are there areas that WPTO should consider for any future Lab Seedling Program focus areas?
4. Aside from funding, what additional resources would be helpful in this program?

Any answers to these questions do not count against the page limit of the RFI (see below) and is considered optional.

EERE WPTO Goals & Mission of Hydropower Lab Seedling Program

WPTO is constantly evaluating the appropriate roles, contributions, and most effective tools for supporting a variety of hydropower stakeholders in different communities within industry, academia, and the National Laboratories. While industry-wide FOAs and laboratory-focused AOPs continue to function as key methods for supporting new projects, it is valuable to explore new ways to support the hydropower industry. This pilot program is intended to establish a relatively low burden opportunity for laboratory researchers to try new, innovative ideas without having to commit to large-scale, multi-year projects from the beginning.

The WPTO Seedling process is designed to address the following objectives:

1. Increase the number of short-term projects that deliver results in under a year;
2. Increase the number and duration of active relationships between the labs, industry, and other partners;
3. Uncover new solutions or approaches that could help achieve the Hydropower Program's overall goals; and
4. Seed research and concepts that provide opportunities for larger initiatives in the future.

Submission Process

WPTO requests a 2-3 page idea submission answering the following:

1. Given up to $50,000, how would you use this funding to address the opportunity areas and goals described above?
2. Given between $50,000 - $100,000, how would you use this funding to address the opportunity areas and goals described above?

Responses will be analyzed with a focus on finding possible activities that:

- Have the potential to significantly impact the goals described in this RFI.
- Show a high level of creativity and innovation applied towards addressing those needs and goals.
- Are naturally structured to produce a *measurable* result/impact or to answer a specific question that is important in the development of the WPTO R&D portfolio.

Disclaimer and Important Notes

EERE will not pay for any costs associated with preparation or submission of responses.

Section II: Idea Submission Instructions and Template

Format

WPTO requests that each National Lab submit no more than 20 submissions, with one idea per response. Each submission may not exceed a total of 3 pages of 11pt font (any additional material over 3 pages will not be analyzed); it is at the labs' discretion on how best to allocate space. Responses are expected to cover three primary sections as listed below. Each response should be formatted as follows:

Idea Title

Relevant lab(s) & other participants (if applicable)

Principal Investigator (name and contact info)

Main point of contact for any other key participants (name and contact info)

Section 1: Idea Description

Summary: 250 word count description of the idea

Background: Describe relevant background info that helps demonstrate the need for this project or program.

Objective: Describe how, if funded, a program like this would measure success during and after the funded period.

Value Proposition: Clear description of the targeted user, intermediate value proposition, and value to the hydropower industry given full concept maturity.

Section 2: With up to $50,000 in funding, describe the idea and activities that could be executed.

Section 3: With $50,000 - $100,000 in funding, describe the idea and activities that can be executed.

The proposal should be submitted in PDF format.

Submission

Responses must be submitted by email to miles.hall@ee.doe.gov by 5:00 p.m. (ET) on May 1, 2020. You should receive an email acknowledging receipt within 24 hours. Please contact Miles.Hall@ee.doe.gov if acknowledgement is not received.

Responses will be analyzed and DOE may reach out to responders for more information.

Proprietary Information

Because information received in response to this RFI may be used to structure future programs, respondents are strongly advised to NOT include any information in their responses that might be considered business sensitive, proprietary, or otherwise confidential. If, however, a

respondent chooses to submit business sensitive, proprietary, or otherwise confidential information, it must be clearly and conspicuously marked as such in the response.

Responses containing confidential, proprietary, or privileged information must be conspicuously marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Federal Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

If your response contains confidential, proprietary, or privileged information, you must include a cover sheet marked as follows identifying the specific pages containing confidential, proprietary, or privileged information:

> **Notice of Restriction on Disclosure and Use of Data:**
> Pages [List Applicable Pages] of this response may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for the purposes described in this RFI [Enter RFI Number]. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

In addition, (1) the header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: “Contains Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure” and (2) every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.