Generating Hydropower's Future

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Hydropower Foundation & National Hydropower Association's Joint Response to DOE Request for Information on Inclusive Innovation and Entrepreneurship

Introduction:
On behalf of the Hydropower Foundation (HF) and National Hydropower Association (NHA), we appreciate the opportunity to provide comment on the above captioned Department RFI.

Hydropower Foundation, Who We Are

Founded in 1994, the Hydropower Foundation (HF) is dedicated to ensuring hydropower's sustainable contribution to a clean energy future. The organization is a 501(c)3 not-for-profit, committed to advancing the Nation's first and most flexible renewable resource, hydropower, through research and education. Funded by contracts, grants, events, industry sponsorships and memberships, the Foundation is primarily comprised of professionals with broad background from industry and the stakeholder community. The Foundation actively engages and serves the clean energy industry by supporting work in education, research, technology development and deployment, and in particular, workforce development, inclusivity, and diversity.

Past Programs and Partnering with the Department of Energy

In meeting its mission, the Foundation has partnered with the Department of Energy in the past in a host of programs, including research and development of technology, academic research on industry challenges, and workforce development such as the Hydro Fellows Program and STEM education.

The Foundation's Interest in the Department's RFI and Programs

The Foundation has a long history of working collaboratively with industry, the academic community, and the Department to support a healthy and environmentally responsible hydropower industry. As the importance of hydropower increases under a rapidly changing energy environment, greater focus on hydropower, improving its overall performance and its capacity to meet the challenges ahead becomes even more critical. The Foundation's mission is

to ensure that hydropower has the tools, skill sets, and the wherewithal to successfully meet systemwide needs from a broad social and energy perspective.

National Hydropower Association, Who We Are

The National Hydropower Association (NHA) is a nonprofit national association dedicated exclusively to preserving and expanding clean, renewable, affordable hydropower and marine energy. NHA's membership consists of over 250 organizations, including consumer-owned utilities, investor-owned utilities, independent power producers, equipment manufacturers, environmental and engineering firms, and attorneys.

Comment on Inclusive Innovation and Entrepreneurship in Climate Technology

The Hydropower Foundation (Foundation) and the NHA applaud the U.S Department of Energy Office of Energy Efficiency and Renewable Energy (EERE) and the Office of Economic Impact and Diversity (ED) for its potential initiative to enable an inclusive and just entrepreneurial innovation ecosystem in climate and energy technologies.

This initiative comes at a time when our Nation is focusing and conversing on both climate change impacts and the need to include and support all its citizens in their pursuit of inclusive and just roles and opportunities. The Foundation and NHA is pursuing these same priorities and welcome the opportunity to provide input in this RFI.

While this RFI is focused on DOE programs, funding opportunities, and its application processes that create access barriers to achieving greater inclusivity, we believe diversity and inclusivity is larger than just DOE funding opportunities for individuals and rests on the need for greater outreach and improved and targeted communications to those communities and populations that remain underrepresented and underserved within our society. To that end, DOE should consider partnering and working with organizations to create greater awareness within targeted populations not only of the funding opportunities that would support entrepreneurship in climate technologies, like hydropower and marine energy, and the opportunities to build careers within clean energy in general. Few within these underrepresented communities have had access to information and knowledge about clean technologies and therefore have no idea that there is an opportunity to use their talents and skills in furthering these industries.

The Hydropower Foundation has a strong history in workforce development and STEM education. In its outreach to universities, community colleges, and trade schools, it has found a significant lack of knowledge about hydropower and other clean energy technologies. Most schools have few programs that prepare a student for a career in clean energy, particularly hydropower.

To attract the brightest minds and unleash innovation and entrepreneurship within underrepresented populations, federal programs need to support outreach to targeted populations that provide information and help link students and young professionals to these industries, including manufacturing and project development within the clean energy and climate

communities. This is critical to bring greater inclusivity and diversity within the clean energy fields.

Recent studies have indicated that the current demographics of the hydropower industry is 68 percent white male. The clean energy community fairs no better. The marine energy industry is an up-and-coming industry and offers tremendous opportunities for new entrants in a host of fields. Yet there is very little diversity within this young industry.

When recruiting, companies go to the same sources from which they came – the same schools and universities and same career paths. Unfortunately, this does not lend itself to widening the pool in terms of people of color, ethnicities, and gender. There is an inherent but unconscious racial and gender bias. This is born out in demographics of the hydropower industry as reported by NASEO and the Energy Future Initiatives. The hydropower industry's workforce is 32 percent female, only 11 percent African American, 16 percent Hispanic, 6 percent Asian and only 1 percent Native American. The broader electricity industry in general fairs only slightly better.

The industry needs to do better and reflect the diversity of our 30 million customers that we serve. The Hydropower Foundation recently revised its mission and strategic plan to address this significant problem. The time is ripe in that the industry will have a significant portion of its workforce retiring offering more opportunities for new entrants. The National Hydropower Association has also taken recent steps to facilitate a more inclusive waterpower industry.

The Foundation has two specific programs that offer industry members across the country an opportunity to meet new entrants. They serve as a catalyst to spur not only interest in hydropower but also new research and problem solving through a boots-on-the-ground opportunity. Its Hiring for Hydro and its Hydro Think Tank programs focus on outreach to universities and the academic community, and link prospective students to industry. These programs offer an opportunity to understand the workforce needs within the hydropower industry and offer an opportunity to better understand specific issues the industry is facing. Particularly through the Foundation's Think Tank Program, students can use their talents to bring new innovative approaches to real-world problems or challenges the hydropower industry faces today. Recently, with the new focus on DEI, the Foundation is reaching out to work with HBCU's where conversations within that community have identified a significant lack of information about clean energy and clean energy opportunities.

NHA recently unveiled its Future Leaders of Waterpower (FLOW), a program geared towards promoting career development and diversity in professional experience, age, gender, racial background, and industry sector in NHA meetings and the waterpower industry as a whole. FLOW provides the next generation of waterpower leaders with clear pathways for career growth and professional development as well as creating a space for industry to connect, share experiences, and learn from each other. This program is open to the public. DOE is encouraged to leverage this program in accessing educational institutions and individuals recently joining the waterpower industries.

The DOE has initiated essential programs focused on STEM and outreach to the academic community. Through the National Labs and its partners, the DOE is doing vital work to address

the need for greater awareness about opportunities and the needs of the future workforce's needs. The DOE strongly supports the research initiated and requested by the National Labs. These undertakings are very productive and genuinely support industry efforts in renewable energy. However, the necessities of planning and budgeting a year ahead for these multi-year programs does limit how responsive the Department can be to a wide audience who are tackling issues in real time. While we understand the DOE is limited by the federal appropriation process, DOE should consider the challenges presented by this limitation and find better ways to support multi-year programs. This is particularly true as outreach to underrepresented populations will require consistent and multi-year efforts to build awareness and build the necessary relationships from which actual programs can then initiate and unleash innovation and entrepreneurship in new technologies, new approaches and new project development.

To diversify our community of people in renewable energy requires a strong outreach to those who would not otherwise know what the opportunities are in these fields and who are not currently equipped with sufficient education and exposure to them.

We suggest the following ideas and comments for your consideration:

1. Awareness of DOE funding opportunities is very limited within underrepresented populations and/or underserved communities. Stronger communications need to be deployed. Such communications should be simple and holistic. We applaud the DOE for their recent efforts with Water Wire and Tethys, Engineering Blast and the newly established energy portal under the STEM program and other recent communications. These are strong efforts to build outreach.

   We recommend that additional strategies be deployed. In particular, we suggest the DOE do the following:

   a) *Establish a calendar of funding opportunities that offers information beyond the WPTO opportunities and would include programs within ARPA-E, SBIR, and SBTT. The calendar would identify whether the opportunity is annual as well as feature a search function with the ability to search key words and filter.*
   b) *Host a workshop on the funding opportunity in advance of the release of the notice of the opportunity.*
   c) *Create programs like those offered by other agencies. For example, the Air Force is offering "Ask Me Anything" workshops where well-seasoned professionals within the air force respond to questions from members and other professionals and industry partners, media, and the public.*
   d) *Consider developing programs that engage student organizations through specific outreach programs that provide opportunities for student activities such as student engineering clubs, etc.*

2. The National Labs do have internship programs that draw from universities at both undergraduate and graduate levels to work in their labs and potentially join their teams

going forward. Internships are amongst the most efficient way for employers to be able to evaluate candidates for jobs and for those students to decide if this is a good fit for them.

We recommend significantly expanding this program and, specifically we encourage you to reach out to the smaller colleges, community colleges, trade schools, and universities who through their history and locations in underserved communities have little awareness of the opportunities and needs within the clean energy and climate fields.

3. To open the eyes of students to the opportunities in waterpower technologies, the Foundation has successfully conducted Hydro Think Tanks where students from local colleges are invited to spend several days at a hydro plant and related facilities and challenged to solve a real-world problem for which cash prizes are awarded for the best solutions. This program draws in industry supporters and can result in more visibility within this industry.

We recommend partnering with organizations that have the experience and relationships in place to conduct awareness building and education to the targeted communities through multi-year commitments to programs such as the Hydro Think Tank Program so they can be repeated regionally particularly in areas underserved today.

4. Current efforts underway at NREL's STEM project, other information systems, including the Portal, developed under this program are extremely important to education and outreach efforts. We also encourage the creation of a national internship program partnering with federal owners and private industry through organizations like the Foundation and the National Hydropower Association.

Specifically, in reference to the Hydropower Foundation, we recommend creating such a national program that could work through existing interdisciplinary cooperatives offered by a host of universities working closely with the Foundation and other industry organizations. For this particular emphasis on DEI, internships programs established with HBCU's, and UNCF would serve to address the need for greater awareness about the opportunities in this field and spur students to use their talents and innovative ideas to further the clean energy and climate fields. We envision a program that would at least be a full year of training with rotations each semester. These rotations could be within a single company exposing the student to market issues, operations, management, and licensing for example, giving the student a holistic understanding of the hydro resource, or could expose the student to wider segments within the industry, perhaps serving some time at a utility and some time at a consulting or manufacturing firm. Each experience would be tailored to the students interests and needs. The program could be funded through a grant to the Foundation which in turn would work with its network of universities and its industry members to match students appropriately. Students that

complete their rotations successfully would be included within the Hiring for Hydro programs of the Foundation and the Foundation would work to place the student within industry upon graduation. Working with the National Hydropower Association, the Foundation would host a national Hiring Day at the Clean Currents Conference that would include students that had successfully graduated from the internship program, conducted research, or developed new concepts under such an internship program. In addition, interns graduating from this program could present their innovative concepts to the NHA WIC program, and to the broad industry through workshops at industry conferences.

We further recommend consideration of the creation of stipends, funding and/or scholarships for students going into a specific area within either hydropower or marine energy and are dedicated specifically to reach the targeted populations. Providing financial support for professors within key departments for various universities within underrepresented communities will be particularly important. Offering housing for interns within such programs also would provide a greater incentive and more access to such programs as many students underrepresented communities would find the high cost of housing during their internship a disincentive.

We further recommend that the DOE continue to support and expand the concept of the Collegiate Competitions in both the marine energy and traditional hydropower areas. These programs can be targeted specifically with HBCU's and augment programs that are offered by UNCF that would expand the opportunities for students to work in the clean energy fields while building greater awareness of the opportunities for career paths that will further clean energy technologies.

5. Currently, National Lab and DOE internship and fellowship programs require that candidates be a student within a degree program at a university or college. While this requirement is understandable, it artificially limits a host of individuals that are studying independently or doing piecemeal coursework as they cannot afford to enter a two- or four-year program. Innovation and entrepreneurship do not rest only in four-year or two-year accredited degree programs. To attract student in underrepresented communities or populations, this requirement is unconsciously biased and serves as a disincentive to the populations the DOE is hoping to attract.

   We recommend that the DOE consider removing this requirement in all of its internship programs, including a requirement that its subcontractors support internships programs that are more open to students that may not be registered within a four or two year university degree program, but are independently taking courses that support clean energy industries, or are young professionals or returning Vets that are not registered in a degree program but have an interest in working within a clean energy field, or are

attending a trade school. This would include both internships and fellowships supported by the DOE.

6. Innovation and invention have been the core fuel to the engine of growth throughout our Nation's history. Many times, these ideas have risen outside the research structures of universities or the labs and by individuals who do not have the wherewithal to pursue their ideas through the inability to fund or obtain an evaluation or test of the idea. This is particularly true of populations within the underrepresented communities as many are from socio-economic strata that lack the funding necessary to pursue their concepts or have the necessary support to encourage their pursuit of innovative ideas.

   We recommend that a portal be established where these ideas and concepts can be submitted to the Department and evaluated in near real time by mentors. If then found to have merit, the new concepts could be assigned to a lab for action as needed.

7. Reestablishing Research Awards Programs with a particular focus on reaching out to HBCU's will go along way in helping students in underrepresented population and communities further innovation within the clean energy fields. Many students within these underrepresented communities cannot afford to pursue research on their own and require stipends and tuition assistance to pursue their work. Establishing these programs working through nonprofit organizations, such as the Foundation, where the application process is fully vetted yet simple is important for ultimate success.

   We recommend the creation of a research awards program that is dedicated to outreach and support of students within the underrepresented populations to bring greater diversity and inclusion to the clean energy fields, while supporting innovation within these fields. The DOE has supported such programs in the past. The Foundation can support the Department in making progress to address this important challenge. Concepts like the former Research Awards Grant Program funded by the Department was a huge success in attracting high-quality young researchers to the industry many of which are now in leadership roles within the hydropower community. That program funded graduate students working in a host of areas of relevance to the hydropower industry. This program could be expanded to work exclusively with HBCU's and partners like the UNCF to support research that could lead to greater innovation within hydropower and other clean energy technologies. The work performed under the Foundation's former research awards program greatly added to industry's body of knowledge in a host of critical areas of need including basin-wide planning, clean water, energy modeling, forecasting and turbine technology to name a few. The outcome: 87 percent of the 33 students funded through this program chose to either join the hydropower industry or continue their hydro-related research at their respective universities. An ancillary benefit, the program increased the number of students and

advisors that focus on hydropower within the academic community today with more professors teaching hydropower courses and students interested in taking those classes. The program saw an addition of 12 new professors, teaching assistants and graduate researchers focused on hydropower. Its success can be replicated and expanded to meet DOE's DEI goals in all forms of waterpower.

Once more, the success of the program, coupled with the relationships built with an expanded network of universities, led to two critically important programs within the Foundation, the Hiring for Hydro program, and the Think Tank program. As noted earlier, both focused on creating opportunities for the hydro industry to meet and work with students and young professionals in universities around the country. Neither of these programs, now totally funded by the Foundation as part of its regular programming, would have developed without the Research Awards grant program. We believe that the Department should reinstate the Research Awards program, or an alternative industry-growth focused program, as part of its national workforce effort and dedicate the program to spur innovation among the targeted populations in underserved communities. Without programs such as the research awards program, students within lower social economic strata could not support their innovative concepts and professors will not provide such support for this work without it being part of a funded activity as funds within the universities and colleges are also extremely limited.

8. Adequate Funding is key to any alteration in the Department's methodology to achieve real success in spurring innovation and creating greater diversity.

We recommend the establishment of a Set-Aside in the budget for programs, ideas and pursuits that are presented that could move DEI initiative forward. Hence whether it is any outreach or research, discussed above, or a design concept that can be evaluated and executed in a short period, the funds and resources need to be made available without undue delay. DOE should offer funding for such programs on a broad solicitation as well as a sole source process that is more streamlined and less burdensome from a time perspective. The current contract process takes too long and many individuals, community based and nonprofit organizations, or schools that serve underrepresented communities that the DOE would want to attract, are disheartened and unable to go through a protracted application process for such grants.

To that end, we recommend increasing the timeframe for responding to funding opportunities. Because of the very nature of project development and innovation, a host of stakeholders, including local government officials, may be involved. To ensure that all stakeholders are engaged and supportive, it may require more time than what is offered in the solicitation. Expand the time opportunity.

In addition, because many within the targeted DEI community will be new to the DOE and its programs, providing a one-stop resource that provides the details and information necessary to successfully complete an application would be extremely useful.

For example, the NSF offers a "Proposal and Award Policies and Procedures Guide" that is extremely helpful, particularly for first time applicants.

9. Many DOE funding opportunities require cost sharing. This is particularly true for project development. The communities the department is hoping to attract to clean energy programs rarely have the resources necessary to meet a cost sharing requirement. Generally, these communities are already strapped for cash.

   We recommend that the DOE consider removing direct/cash cost share requirements.

10. The Department's goal to attract support for furthering innovation within underrepresented and underserve communities needs to consider the fact that many of these communities have been left behind. They receive little federal or state funding from other agencies, have poor revenue opportunities, and little income from local or private sources. Their knowledge of how to attract resources is limited. As stated, their awareness of funding opportunities is also limited. Hence their ability to devise collaborative programs to pool resources and attract additional investment is poor. As such, their financial needs may be larger.

    We recommend that the DOE consider creating larger awards to underrepresented and underserved communities to address the inequity of their overall resources. At a minimum, the department should consider programs that help to expand the opportunities to pool other funding opportunities through more technical support in the application process.

Conclusion

We thank the DOE for allowing us to respond to this request. Once again, we commend DOE for its recognition of the importance of bringing greater diversity and inclusion within its programs to spur more innovation and entrepreneurship within the clean energy and climate technology fields.

We urge DOE to consider the recommendations noted above and we stand ready to work with the department in our outreach to diverse communities to ensure that a) they are aware of the opportunities within these fields; and b) have the tools and opportunities to pursue innovative ideas and careers within albeit manufacturing, project development or existing project support.