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## **New Hydropower Technologies - Issues and Opportunities FERC Hydropower Infrastructure Technical Conference December 6, 2006**

### **Energy from Ocean Waves, Tides, Currents, and Free-Flowing Rivers: What are the resource, technology, and business issues and opportunities?**

NHA thanks the Commission for convening this conference to consider the challenges facing commercial development of these new technologies for generating electrical energy from waves (movement of ocean or large lake surface water up and down), tides (movement of water in and out of estuaries and bays), and currents in any body of water, including man-made conduits and free-flowing rivers. These new technologies will be clean and sustainable, producing no greenhouse gas emissions, and present tremendous growth potential in meeting the nation's energy needs. NHA and EPRI are collaborating on a "road map" to quantify and illustrate this growth potential. The road map is still under development, but once released we can share this information with the Commission.

### **What does NHA have to contribute?**

NHA has many members who have a specific interest in the development of hydrokinetic technology. Because of this interest, NHA has created a New Technologies Council within the Association. NHA and Council members have technical expertise with hydrokinetic technology, including the combined experience of staff at numerous utilities, both investor-owned and public; at independent power project developers; and at equipment suppliers and consulting services firms. NHA is committed to improving the growth and success of the hydropower industry, and its members have made significant contributions to the expansion of a common understanding of these new hydrokinetic technologies through co-funded research and development. NHA and our members pledge to work with the Commission on any follow-up initiatives resulting from this workshop.

### **1) Financial Issues: What are the costs of these new technologies?**

- The costs of these new "hydrokinetic" technologies vary greatly depending upon the specific technology, but costs have been estimated in the range of \$1500 to \$5000 per kW. Because these technologies are in their infancy, regulatory, mitigation and enhancement costs are currently unknown. The uncertainty regarding the cost that the regulatory process will impose on the technologies adds another burden that hinders project developers' ability to raise capital and extends the development timeline. The funding, development and implementation of these new technologies is heavily dependent upon regulatory certainty. A clear timeline and a stream-lined and predictable regulatory process will influence and encourage financial investment.

## **2) Regulatory Issues: Do the existing FERC permitting and licensing processes work for these new technologies?**

- The new technologies tap the free flow of water, whether in oceans or elsewhere, and are fundamentally different from conventional hydropower technologies in that they do not involve dams, impoundments, diversions, reservoirs or high-speed turbines associated with conventional hydropower. Rather, some of these new technologies involve slow-moving mechanisms or forced air components. These new hydrokinetic technologies have fewer potential adverse environmental effects than conventional hydropower using dams, impoundments, diversions, etc. This fundamental difference calls for a substantially new regulatory paradigm, and the Commission should revise the basic regulatory principles to provide modifications to existing rules for this new segment of the industry.
- This new regulatory paradigm should include a shorter, more efficient, stream-lined licensing process that can be completed within 18 months, and in no event longer than the term of a preliminary permit. The new process should effectively integrate FERC's federal permitting and licensing obligations with that of other applicable federal statutes. Such integration would permit project review to be concurrent, non-duplicative and coordinated among the jurisdictional agencies, rather than sequential.
- Preliminary permitting for this special class of projects should reflect the application of the Commission's policies of fairness in site competition and vigilance in assuring legitimate efforts are made at "proving up" site potential.

## **3) Environmental Issues: What are the known and potential effects of these new technologies on the environment and other resources?**

- Although there are currently no commercial tidal or wave projects operating in the United States, there have been reports prepared by the Electric Power Research Institute (EPRI – 2005, 2006) on these technologies that discuss their potential effects, some of which are listed below. Additionally, projects are operational in other countries, including the United Kingdom.
- There are currently no tidal instream commercial projects in operation in the United States, and there is no field demonstrated environmental effects data available at this time. However, potential effects that may result from tidal instream energy conversion technologies may include contact with a component of a turbine or by flow characteristics associated with the operation of the project. Effects are expected to be minimal on fish, marine mammals and other marine life because of the open nature and slower operating speed of the turbines and the high perceptive powers and agility of marine fish and mammals giving them the ability to avoid collisions. Effects to bottom habitat may occur as a result of securing permanent infrastructure to the substrate. Noise produced from a project would be technology specific and is expected to be relatively low due to the slower speed of operation.
- For wave energy projects that require mooring lines such as buoys, potential entanglement would also be a consideration. Other areas of consideration include the potential effects from withdrawal of wave energy, visual aesthetics, and existing uses of the project area. As with any proposed project, issues will be technology and site specific and will become better understood as more projects are developed. The environmental assessment prepared by the U.S. Department of the Navy for a proposed project that will consist of up to six wave energy

conversion buoys off the coast of Hawaii concluded that the project will not significantly impact human health or the environment and there will be no cumulative adverse environmental impacts from the project.

- Especially in the early years of this new segment of the hydropower industry, the building of collective knowledge of environmental effects from these hydrokinetic technologies should be a priority. Combining non-proprietary data and information across individual license applications and associated environmental documents (i.e., licensee's exhibits/PDEA/FERC EAs, etc.) can build a more complete understanding of those potential effects to a resource requiring further scrutiny. Individual license holders and applicants, as well as resource managers, could benefit from this collective knowledge in evaluating the need for additional information. Site-specific studies should only be required based on specific criteria and a project nexus that justify the need for more detailed information and be proportional to the effects of the project to the resource.

#### **4) Opportunities and Recommendations**

- NHA encourages the Commission to implement new procedures for handling preliminary permitting and licensing in a manner that facilitates the development of these new technologies as expeditiously as possible, while at the same time providing for an appropriate level of environmental and technical review.
- Specifically, NHA recommends that the Commission create a shorter, more efficient permitting and licensing process that better matches the siting and license-preparation timelines for these projects. The process should capitalize on prior studies and limit the extent of required site-specific studies, which in turn would accelerate the regulatory and permitting process.
- The Commission should also work with any other Federal and State agencies that have regulatory authority over the projects to integrate its preliminary permitting, environmental review and licensing processes with those other jurisdictional agencies, thereby accelerating and stream-lining the overall process. Additionally, the Commission could work with other jurisdictional agencies to pre-approve key sites for their ability to have environmental issues raised and addressed up-front. This would encourage private financial investment in new technologies in those areas by providing regulatory certainty.
- The Commission should waive statutory licensing requirements for new technology projects of 1.5 megawatts or less, pursuant to its authority under FPA section 10(i).
- The Commission should provide a permittee/licensee the flexibility to evaluate and develop its project in phases. A phased development approach gives the developer needed flexibility and enhances the collective agency knowledge of efficient and environmentally compatible approaches to commercialization of new technologies.
- The Commission should encourage the efficient development of hydrokinetic power resources by requiring enforceable milestones during the term of a preliminary permit that a permittee must achieve in order to maintain the permit, including the development of reasonable limitations to the geographic scope, based on the technology and other information developed by the permittee. The permittee would still be able to select the most appropriate technology and the optimum site within this area consistent with existing Commission precedent.

- The Commission should encourage the development of demonstration projects by limiting and streamlining regulatory permitting and environmental review while allowing project developers to derive revenue from these pilot projects.

## **Conclusion**

Once again NHA thanks the Commission for sponsoring this workshop. We are very pleased with the Commission's interest in the new hydropower technologies. NHA believes there is great untapped potential available utilizing wave, tidal and instream technologies. Developing these domestic, clean technologies is of particular importance at this time when the nation's energy demands continue to increase significantly. NHA looks forward to working with the Commission to develop the appropriate path for the advancement of these resources. If you have any questions regarding this paper, please feel free to contact NHA's Linda Church Ciocci or Jeffrey A. Leahey, Esq. at 202.682.1700.