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**Testimony on “Keeping Hydropower Affordable and Reliable: The Protection of Existing Hydropower Investments and the Promotion of New Development”**

**Committee on Natural Resources, Subcommittee on Water and Power  
The United States House of Representatives**

**September 19, 2013**

Mr. Chairman and Members of the Committee:

My name is Michael J. Sale. Since February of 2013, I have served as the Executive Director of the Low Impact Hydropower Institute (LIHI). Our Institute is a non-profit 501(c)(3) organization dedicated to reducing the impacts of hydropower generation through the certification of facilities that have avoided or reduced their environmental impacts. I was a member of the Governing Board of the Institute prior to becoming Executive Director; I was also part of the Implementation Task Force for LIHI in 1998. My professional career spans more than 30 years, most of which have involved finding solutions to the effects of energy development on the environment. I was a research scientist and manager at Oak Ridge National Laboratory for 28 years. I have conducted hydropower studies for the U.S. Department of Energy, the Federal Energy Regulatory Commission (FERC), the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Forest Service, and a number of industry organizations, such as the Electric Power Research Institute (EPRI), Idaho Power Company, and others.

I thank you for the opportunity to provide my perspectives on hydropower – the foundation of renewable energy in the U.S. My testimony today will focus on my Institute, how it operates in today’s hydropower sector, and my opinions on the importance of hydropower. The production of energy from hydropower and the protection of our environment are not mutually exclusive, as I will explain – LIHI works to further both these goals.

**I. Background on the Low Impact Hydropower Institute**

LIHI was established in January 2000 by a group of river conservation organizations and renewable energy marketers that anticipated the need to identify acceptable hydropower sources in green energy markets that would be developing soon. The LIHI Bylaws currently require that one half or more of its Governing Board members be representatives of environmental organizations. There are thousands of hydropower dams in the United States located on many of our most important rivers and streams. These dams can produce pollution-free electricity, but they also have the potential to produce significant adverse impacts on fish and wildlife and other resources.

LIHI’s mission is to reduce the impacts of hydropower dams through market incentives. LIHI does this through a voluntary Hydropower Certification Program, designed to help identify

and reward hydropower dams that are minimizing their environmental impacts. Just as an organic label can help consumers choose the foods and farming practices they want to support, the LIHI certification program can help energy consumers choose the energy and hydropower practices they want to support and can help energy providers sell their environmentally preferable product at a premium.

In order to be certified by the Institute, a hydropower facility must meet criteria in the following seven areas:

1. river flows,
2. water quality,
3. fish passage and protection,
4. watershed protection
5. threatened and endangered species protection,
6. cultural resource protection, and
7. recreation

In addition to those criteria, to qualify, a project must not have been formally recommended for dam removal by a resource agency. The current LIHI program requires that all criteria be satisfied on a pass/fail basis. Existing hydropower facilities, incremental additions of generating capacity to existing facilities, and new powerhouses constructed at existing dams are all eligible to apply for certification. Facilities under construction may be certified before they begin operations, if a sufficient public record has been established.

The criteria standards are typically based on the most recent, and most stringent, mitigation measures that are formally recommended for the dam by state and federal resource agencies. A hydropower facility meeting all eight certification criteria will be certified by LIHI, and will be able to use this certification when marketing power to consumers. Public documents explaining the current LIHI certification program can be accessed via our web site at <http://www.lowimpacthydro.org/existing-certification-application-program.html>.

To date, 109 facilities at 165 dams have received LIHI certification. The total capacity of LIHI-certified facilities is more than 4.3 GW. These facilities are located in 28 states across the U.S., with the largest concentrations in the northeastern and northwestern states. States with the most certified facilities are Massachusetts, Vermont, Maine, New York, Oregon, New Hampshire, and Washington. Certified facilities are at dams of all sizes, facilities built into water conveyance systems, and new powerhouses built at previously non-powered dams.

LIHI does not set a size limit for eligible facilities, because we do not consider that generating capacity is an adequate predictor of impacts. Approximately 20% of our LIHI-certified facilities are larger than 30 MW and 45% are larger than 5 MW. The largest project we have certified is Seattle City Light's Skagit River project, which has a total capacity of about 700 MW and includes three dams, 300 to 600 feet in height. The fact that such large dams can be designed and operated in a way that protects and enhances the environment is one of the more important outcomes from our certification program.

## **II. Current and Future Roles of Third-Party Certification of Hydropower**

Voluntary, third-party certification programs such as LIHI's play an important role in today's renewable energy markets in several ways. One way is by informing consumer choice and the decisions of regulators that manage state renewable energy programs. Another is by enabling facility owners access to higher revenues when those are associated with investments in environmental protection and enhancement. Owners of facilities certified by programs like LIHI can use their recognition to qualify for state Renewable Portfolio Standards (RPSs), to sell Renewable Energy Certificates (RECs) into green energy markets, in public relations campaigns, or other ways. Some of the more important states that have incorporated LIHI directly into their renewable energy policies are Oregon, Massachusetts, Pennsylvania, Vermont, and Ohio. Many other states have broader environmental restrictions on the types of hydropower that qualifies for their RPS – LIHI certification satisfies these broader restrictions as well.

Hydropower poses a dilemma for emerging energy markets because it is renewable, but it can also involve substantial environmental impacts, depending on where it is sited, how it is designed and how it is operated. In fact, all energy sources involve some level of impact, but hydropower has earned a reputation for extreme impacts. However, not every dam or hydropower project involves unacceptable impacts. The challenge for industry, power marketers, environmental organizations, and consumers is to agree on a system or set of standards that can be used to distinguish acceptable (i.e., low-impact) facilities.

The argument is sometimes made that a current FERC license is a sufficient measure of "low-impact" or environmental preferability. There are reasons to reject that position, at least as the basis for a voluntary certification program for access to renewable energy incentives. The Federal Power Act that defines FERC licensing procedures requires the balancing of power and nonpower benefits of water resource development. While I agree completely with that balancing requirement, it sometimes can force deciding for the maintenance of power production over some environmental considerations. FERC is not, and probably should not be, required to choose the environmentally preferable alternative in its licensing decisions. In some cases, FERC does not even consider the environmentally preferable alternative. The end result is that the consumer cannot assume that a FERC-licensed project is meeting the highest standards for environmental performance over the full spectrum of potential impacts. An additional process such as our LIHI Program is needed. The public record that is part of FERC licensing proceedings does provide important and valuable input to third-party certification, however.

There are some important, new applications of hydropower certification that are emerging beyond FERC licensing. For example, in the case of license exemptions, which are likely to increase in frequency due to the hydropower legislation passed in this Congress, the public record and the natural resource management positions are not as well developed as in regular FERC licenses. Also, hydroelectricity that is imported into the U.S. from other countries is not subject to the rigorous environmental review and conditioning that it is in the U.S. In both these cases, the additional review provided by a voluntary program such as ours could be very useful in informing consumer choice for these types of hydropower resources. Our organization is currently reviewing our certification program to see if there are more objective, standards-based certification approaches that can be developed for these situations.

### **III. Opportunities for Hydropower**

Although hydropower is an established energy technology that has been in operation in the U.S. for more than a century, we are still making technological improvements in hydropower. Many of these advances are in the area of environmental performance. Today, there is a strong scientific basis for scheduling water releases from dams that protect and enhance downstream aquatic habitats. We also have new, advanced turbines that add oxygen to discharges from dams to enhance downstream water quality at energy efficiencies that equal or exceed older turbine designs. We have fish friendly turbines that can, in many cases, pass fish downstream with much higher survival rates than traditional turbines, and we can do this too without losing electricity generation.

Unfortunately, because many of the new hydropower technologies today are pre-commercial, they tend to be more expensive than off-the-shelf hardware. The development pathway for new technologies requires extensive demonstration and testing to bring down the uncertainties in cost and performance. Total costs of new technologies can and do come down after sufficient deployment and testing. To bear the cost of new technology demonstrations, dam owners require some form of assistance or incentive. Full access to renewable energy markets can provide such assistance, and the independent certification of low-impact facilities is an effective way to enable this access.

An example of how this would work is as follows: assume a project is up for relicensing and downstream passage of a sensitive fish species is at issue – resource management agencies want to see mortalities due to passage through turbines minimized. Mitigation alternatives range from spilling water during downstream migration period, foregoing power generation; new screens and bypass structures to collect fish and route them around turbine intakes; or installation of a new, advanced fish-friendly turbine capable of passing fish with little or no mortality. The third alternative would allow for a win-win outcome with more energy and better environmental performance. However, the third alternative is more expensive than the other two. The resource agencies are supportive of testing the new technology, because it could offer better solutions both at this site and others, if it was proven successful. The project applies for and receives LIHI certification as low impact, subject to deployment and testing of the new technology. By being certified, in part due to the increase in environmental performance, and gaining access to REC markets and/or a state RPS, the project can receive a higher price for its energy and better afford the costs of the new technology.

In addition to the opportunity to add new technologies, hydropower has another important opportunity today: that is, as an enabler of other, intermittent, non-hydro renewables, such as wind power. Hydropower is the most flexible of the renewable energy technologies. Its ancillary benefits are well-known, but needed more now than ever before to add stability and resiliency to our electrical grids. Maintaining the operational flexibility of hydropower is essential to preserve its value. LIHI recognizes this, which is one reason why we do not require run-of-river operations in our certification criteria.

#### **IV. Conclusion**

Based on my experience with hydropower over my career, there is no doubt that hydropower is an essential part of the renewable energy portfolio in the U.S. and that almost all of its environmental impacts can be successfully mitigated. There are real opportunities to increase the renewable energy from hydropower over the next several decades and to do that in ways that protect and enhance river ecosystems. Organizations like LIHI have a constructive role in clarifying the best energy solutions for our country. We do not set renewable energy policy – that authority resides now mostly with the States. However, I believe that certification programs such as ours can help make renewable energy policies work better, by providing an incentive that does not otherwise exist, and returning value to facility owners, some of which can be reinvested in protection and restoration of river ecosystems.

I would be happy to answer any questions, now or after this Hearing.