



# Annual Report 2019



Cover page: A bridge crossing the canal at the Ice House facility (LIHI #44) in Ayer, MA. The canal dates to 1790. The dam and powerhouse were built in 1909 and rehabilitated in 2002. The facility contributes to the MA renewable portfolio standard, a key source of revenue for the small project.

A little slice of the tailrace (where the water reenters the river after passing through the hydropower turbines) on the Chicopee River in Massachusetts. This was taken during the UNIDO delegation site tour of the Collins facility, (LIHI#88).

# From our Leadership

Annual reports are always a bit tricky. By definition, they are a review of the year just past, anchored by audited financial statements. Yet, the reality is that by the time the audit and internal review is complete, we are well into the new year. In past years, we have stayed true to the definition of the annual report, providing a retrospective snapshot of our achievements.

As we write this it is mid 2020. Our 2019 financial report shows another year of fiscal strength, steady inclines, solid foundations. Yet the COVID-19 pandemic quarantines and shutdowns dominate our thoughts. It impacts everything – our family lives, the health of our friends and loved ones, our travel schedules. It also impacts electricity use, gas prices and thus wholesale electricity costs. It is likely that as load declines, regulatory renewable energy credit requirements will decrease along with it. While the first half of 2020 has shown no decline in LIHI Certification renewals or new applications, we do not know what the future holds any more than anyone else. What we do know, however, is that the decrease in transportation and decline in energy use has helped drive a temporary drop in greenhouse gas emissions. Our society needs to figure out how to make these declines permanent. We need to be smart about how we invest recovery funds at the federal and state level. We need to encourage clean energy sources. And we need to remain steadfast that those increases do not lead to a decline in local environments. In other words, programs like LIHI Certification remain as important as ever, if not more important.



The LIHI organization was founded twenty years ago as a way to encourage and reward environmental stewardship. Now it is a benchmark, still the only in-depth description of what “low impact” hydropower is. LIHI will continue to recognize, reward and encourage hydropower owners who meet our standards. And, we will put increasing emphasis on the third leg of our purpose – to educate the public about the impacts of electric power generation. For the sake of our climate, we need to generate more clean energy such as hydropower. But we also need to make sure such urgency does not take a toll on local environments which are still key to climate adaptation in their own rights. We hope that you will support and join us in these efforts.



Shawn Seaman, Chair



Shannon Ames, Executive Director

## Mission

### Criteria

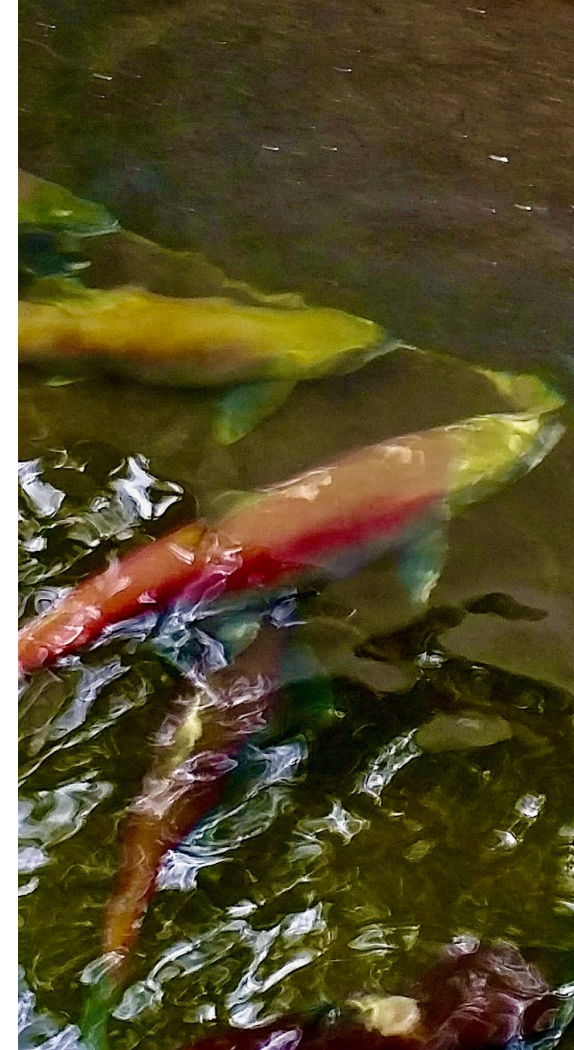
Setting criteria for characterizing hydropower facilities as low impact

### Program

Conducting a program to certify hydropower facilities that meet these criteria with a goal of (1) reducing the environmental impacts of hydropower generation; by (2) creating a credible and accepted standard for consumers to use in evaluating hydropower

### Education

Making information about the environmental effects of power generation available to the public





# Criteria

In 2019, the board undertook various initiatives to ensure our Low Impact Criteria, including eligibility requirements, incorporate today's priorities. The Criteria were originally developed in 1999 and the first Certificate was effective in 2001.

Staff and the board's Technical Committee reviewed a number of program aspects in 2019 including the potential for expanding Certification to Canada and moving the eligibility date for dam construction. While work continues on both subjects, the board elected not to move on either program element in the short term. No change does not mean no progress, however. These efforts expanded our appreciation for innovative efforts underway in the realm of new hydropower construction and will set the stage for future consideration.

## 2019 Firsts

**1st Certificate in Virginia**

**1st non conduit "very low impact" Certification**

**1st certification with an Archimedes Screw**

The Burnshire project (LIHI #152) was the first LIHI Certified project in the state of Virginia. Burnshire was Certified as "very low impact" (or VLI for short) earning it a ten-year certificate term. It was the first conventional hydropower facility to earn this status. To date, all other VLI projects are conduit projects. Conventional hydropower uses a dam to divert water into turbines located inside powerhouses. Conduit projects have turbines within pipelines. These pipelines are often part of drinking water or irrigation systems.





# Program

LIHI issued its first Certificate in 2001 after receiving its first application in 2000, the year the organization was established with its first Executive Director. Since then, the program has grown exponentially, primarily driven by state renewable portfolio standards.

The Certification program continued to grow in 2019 even as renewable energy credit prices declined. Signs seem to be pointing to an increased preference for energy purchasers and generators to enter into bilateral agreements that bundle both renewable attributes and power.

The majority of our Certificate holders are small in capacity but the range in sizes is impressive - the smallest site is 65 KW while the largest certificate is over 700 MW.

**154 Active Certificates**  
**262 Powerhouses and dams**  
**23 States | 93 Rivers**  
**84% Certificates <30 MW**  
**16% Certificates >30 MW**  
**63% New England**  
**14% New York**  
**23% Certificates Rest of US**

***Small size should  
never be confused  
with Low Impact***

The Pownal facility (LIHI #149) in Vermont was formerly a superfund site. Changing ownerships and perspectives have led to greater stewardship.





The Hanover Pond Dam Hydroelectric Project (LIHI #165) is located on the Quinnipiac River in Meriden, CT. Historically, over 100 Industrial Revolution-era dams existed on the Quinnipiac River. A dam was originally built at the approximate location of the existing dam in the 1850s and Hanover Pond was impounded to provide hydropower to the former Meriden Cutlery Factory which closed in the 1920s. The dam was reconstructed by the City of Meriden in 2005-2006 at which time an upstream fish passage facility was installed. Both the dam and fishway are owned by the City. The upper photo shows the project from above. The lower photo is of the lower end of the Archimedes Screw Turbine.



## Handbook Highlights

There are certain criteria in the 2nd Edition Handbook that offer PLUS standards related to advanced technologies. PLUS standards earn an applicant extra years on their LIHI Certificate.

Advances in technology have accelerated in recent years thanks in part to the U.S. Department of Energy's Waterpower Technologies Office and the rewards it offers to encourage lower impact development in the industry. Advancements are also due in part to a new generation of hydropower developers who design projects from environment to power generation rather than the reverse.

Some advanced technologies are as old as Archimedes but new to the U.S. hydropower industry fleet. At the Hanover Pond Dam just such a technology was installed in 2017. The Project is the first hydroelectric facility in the United States to employ the Archimedes Screw Turbine (AST) for power generation. Named for the original Archimedes whose design moved water up ancient aquifers, the AST produces electricity through a slowly turning screw attached to a variable speed gear box and generator. The AST is known for its ability to pass fish safely downstream and was chosen for installation at the project because of this attribute with support from state and federal resource agencies. This project is eligible for a PLUS standard in downstream fish passage for this advanced technology.



# Education

**1st Delegation from China**

**2 4th grade classes hosted/visited**

**6 Conference presentations**

**3 Research paper contributions**

Providing information about the impacts of hydropower to the public has been a pillar of our mission from the beginning. Educational efforts have taken off in recent years. In 2019, LIHI hosted a delegation from China comprising hydropower owners, operators, government officials and representatives from the United Nations Industrial Development Organization (UNIDO). Wanting to learn more about the LIHI program and economic incentives for Certification, the delegation visited facilities in Massachusetts and New Hampshire. One day was devoted to sharing information at a conference.

As LIHI continues to field questions about our program from all over the world, we look forward to more information sharing and potentially a guide to developing a similar program in other countries. We also continued to visit classrooms and organize class visits to LIHI Certified sites. Electricity and renewable energy is typically taught in the 4th grade. The astute questions asked by these next generation hydro operators and environmentalists is a bright sign for the future of the industry.



UNIDO delegation members view the dam at the Lowell project (LIHI #142) in Lowell, MA. This was the fourth stop to observe LIHI Certified facilities that demonstrate various elements of the LIHI Criteria.



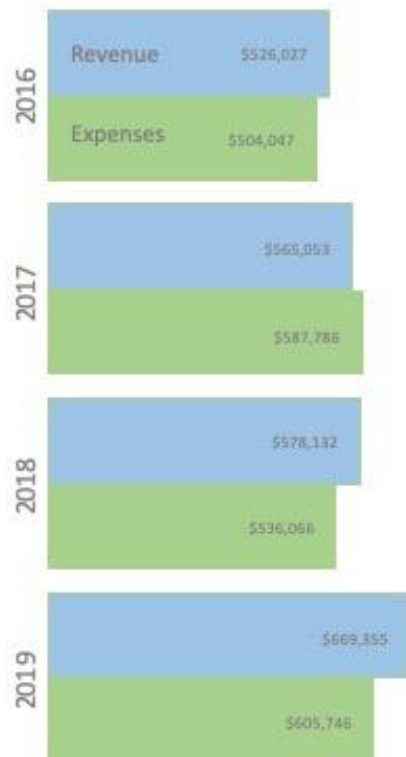
# Financials

LHI strives to remain fiscally strong while maintaining fees as low as possible. 2019 was another year of modest growth for the organization with annual fees rising along with new Certificates. Expenses as a percent of revenue declined for the second year in a row through careful management. Current assets grew to a four-year high achieving a strategic goal of maintaining a three-month cash reserve.

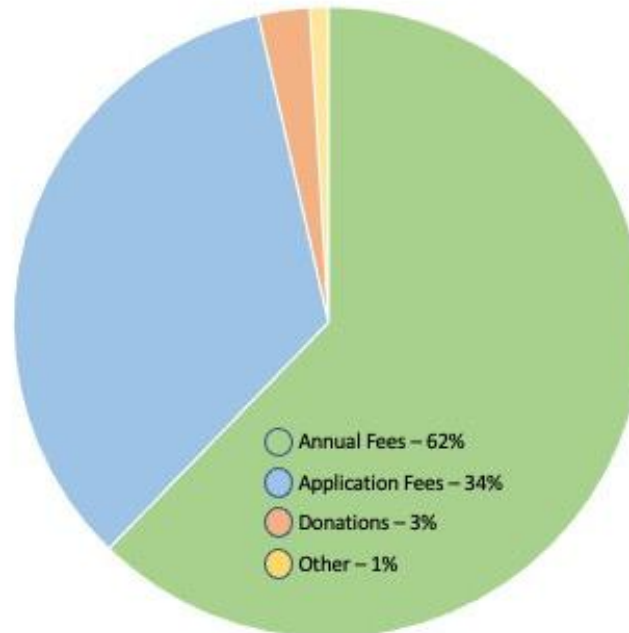


Photo and installation by Ned Carlson, copyright 2020

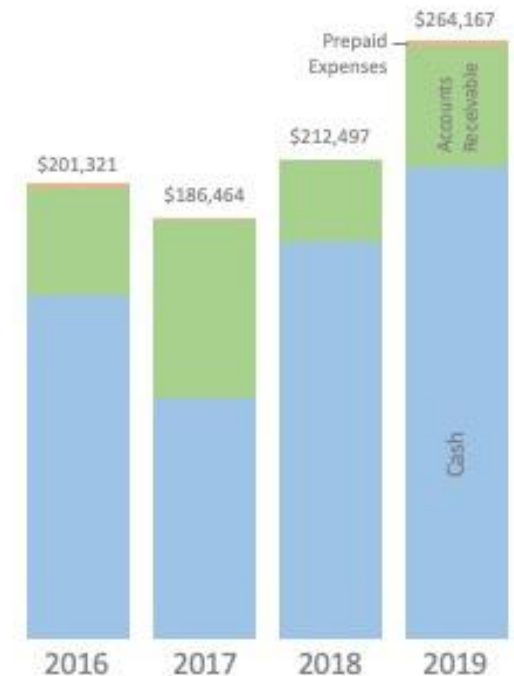
## Revenue vs. Expenses



## Revenue



## Current Assets





## Statement of Financial Position

	2019	2018
<b>ASSETS</b>		
<b>CURRENT ASSETS</b>		
Cash	\$209,572	\$176,901
Accounts Receivable	\$53,221	\$34,624
Prepaid Expenses and Other Assets	\$1,374	\$972
Total Current Assets	\$264,167	\$212,497
<b>OTHER ASSETS</b>		
Security Deposit	\$1,300	\$1,300
Website, Net	\$1,290	\$4,642
Total Other Assets	\$2,590	\$5,942
Total Assets	\$266,757	\$218,439
<b>LIABILITIES AND NET ASSETS</b>		
<b>CURRENT LIABILITIES</b>		
Accounts Payable	\$8,363	\$13,162
Accrued Payroll	\$7,722	\$5,404
Accrued Expenses	\$6,841	\$14,925
Deferred Revenue	\$26,784	\$31,510
Total Current Liabilities	\$49,710	\$65,001
<b>NET ASSETS - Without Donor Restrictions</b>	\$217,047	\$153,438
Total Liabilities and Net Assets	\$266,757	\$218,439

## Statement of Activities

	2019	2018
<b>REVENUE AND SUPPORT</b>		
Annual Fees	\$416,837	\$406,278
Application Fees	\$228,496	\$150,591
Contributions	\$17,660	\$19,140
Interest Income	\$11	\$6
Other Revenue	\$6,351	\$2,117
Total Revenue and Support	\$669,355	\$578,132
<b>EXPENSES</b>		
Program Services Expense	\$499,124	\$445,813
Total Program Services Expens	\$499,124	\$445,813
Support Services Expense		
Management and General	\$106,622	\$90,253
Total Support Services Expens	\$106,622	\$90,253
Total Expenses	\$605,746	\$536,066
<b>CHANGE IN NET ASSETS FROM OPERATIONS</b>	\$63,609	\$42,066
Net Assets - Beginning of Year	\$153,438	\$111,372
<b>NET ASSETS - END OF YEAR</b>	\$217,047	\$153,438



# Board



## Governing Board

Shawn Seaman, Chair, MD (MD Dept. of Natural Resources)  
 Julie McNamara, Vice Chair, MA (Union of Concerned Scientists)  
 Jack Palmer, Treasurer, DE (Kleinschmidt (retired))  
 Nick Niiro, Secretary, CA (San Francisco City Attorney's office)  
 Julie Gantenbein, CA (Water & Power Law Group)  
 Rick Glick, OR (Davis, Wright & Tremaine)  
 T.J. Heibel, MD (Pacific Northwest National Laboratory)  
 Tara Moberg, PA (The Nature Conservancy)  
 Brenda Pracheil, TN (Oak Ridge National Laboratory)  
 Gabby Queenan, MA (Mass Rivers Alliance)  
 John Seebach, VA (Pew Charitable Trusts)  
 Vicki Taylor, NC (Catawba-Wateree Relicensing Coalition)  
 Mark Zakutansky, PA (Appalachian Mountain Club)  
 Lisa Zarek, FL (Brookfield Renewable (retired))

## Advisory Board

Elizabeth Ablow, WA (Seattle City Light)  
 Jonathan Burnston, NY (Karbone)  
 Robert Deibel, CO (US Fish & Wildlife (retired))  
 Sean Faulds, ON (Brookfield Renewable)  
 Sarah Hill Nelson, KS (Bowersock Mills & Power Co.)  
 Maya Kelty, CA (3Degrees)  
 Andrew Locke, MA (Essex Hydro)  
 Deb Malin, OR (Bonneville Power Administration)  
 Jennifer Martin, CA (Center for Resource Solutions)  
 Dan Parker, NY (Eagle Creek Renewable Energy)  
 Jon Petrillo, RI (Gravity Renewables)  
 Sunny Radcliffe, OR (Portland General Electric)  
 John Ragonese, NH (Great River Hydro)  
 Philip Raphals, QC (Helios Centre)  
 Tim Welch, VA (US Department of Energy, WPO)  
 Todd Wynn, MD (Hull Street Energy)

### *Executive Advisory Committee:*

Richard Roos-Collins, CA (Water and Power Law Group)  
 David Youlen, NY (Eagle Creek Renewable Energy)

Each year the LIHI board gathers for its annual meeting. Given that the governance team is spread across North America, in-person meetings are both crucial for in-depth face-to-face time and for longer strategic discussions than one normally can have on a conference call. We take advantage of these opportunities to visit LIHI Certified facilities. In 2019, we visited Bowersock Mills Hydro (LIHI #15) in Lawrence, KS - a third-generation family owned business and one of only a handful of hydro facilities in the US owned by a woman (who also happens to serve on the LIHI Advisory Board).

Fishing is a popular sport near hydropower facilities. Recreation is one of the eight criteria LIHI evaluates to determine Low Impact status. Here, fishermen gather at the New Home Dam project (LIHL #136) in Orange, MA. Popular fish in the Miller's River include smallmouth bass along with brook, brown, and rainbow trout. Also typical to many hydropower facilities, especially in the Northeast, this facility used to power a mill, long since closed. These days, hydropower facilities like this one often provide the largest source of property taxes in rural communities.

Sadly, we lost two formative executive directors in 2019. This annual report is dedicated to them - Fred Ayer and Mike Sale - as well as to all of the friends and volunteers who brought LIHI to life in 2000.

All photos are staff photos taken during field trips and educational visits in 2019. Thank you to all of the Certificate holders who took time to host us.





Originally LIHI Certified in 2004, Bowersock Mills Hydropower, located in Lawrence, KS, is the only conventional hydropower plant in the state. It currently contracts its power and RECs to the University of Kansas, Lawrence.

