

RENEWABLE ENERGY MARKETS FOR HYDROPOWER: FACT OR FICTION?



DANA HALL, DEPUTY DIRECTOR

LOW IMPACT HYDROPOWER INSTITUTE



“The Low Impact Hydropower Institute (LIHI) is a non-profit 501(c)(3) organization dedicated to reducing the impacts of hydropower generation through the voluntary certification of hydropower projects that have avoided or reduced their environmental impacts.” – LIHI mission statement

www.lowimpacthydro.org

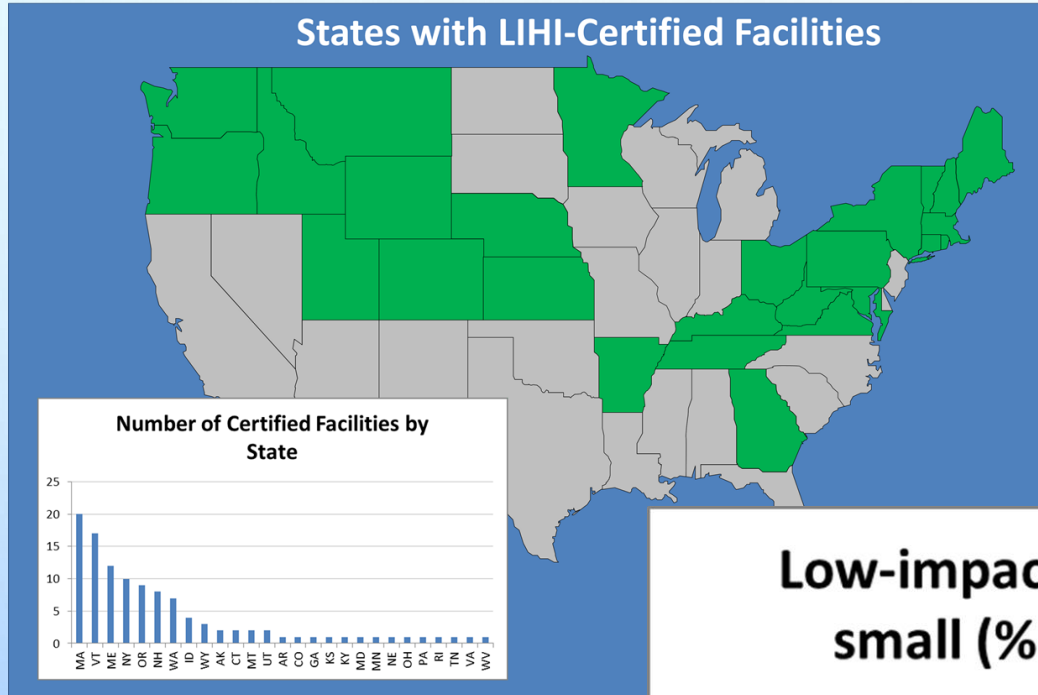


LIHI WAS CONCEIVED IN 1998

CERTIFICATE NO. 1 – STAGECOACH, MARCH 27, 2001
CERTIFICATE NO. 121 – LAWRENCE, MARCH 13, 2015

- INITIAL LEADERSHIP FROM CRS, GREEN MOUNTAIN POWER, AND SEVERAL ENVIRONMENTAL NGOS
- **OUR GOAL** – CREATE AN INDEPENDENT, OBJECTIVE, AND TRANSPARENT PROCESS TO VERIFY GREEN HYDROPOWER TO INFORM CONSUMER CHOICE IN GREEN ENERGY MARKETS
- **OUR STRATEGY** -- PROVIDE A MARKET INCENTIVE TO REDUCE THE IMPACTS OF HYDROPOWER GENERATION
- **OUR VISION** -- ACHIEVE DUAL GOALS:
 - ENHANCING ENVIRONMENTAL QUALITY AND INVESTMENT IN RIVERS
 - CONTRIBUTE TO INCREASING SUPPLY OF GREEN RENEWABLE ELECTRICITY

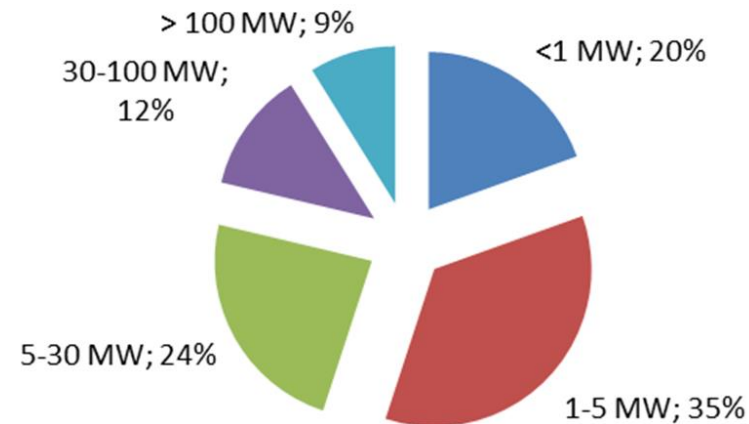
LIHI IS A NATIONWIDE VOLUNTARY PROGRAM



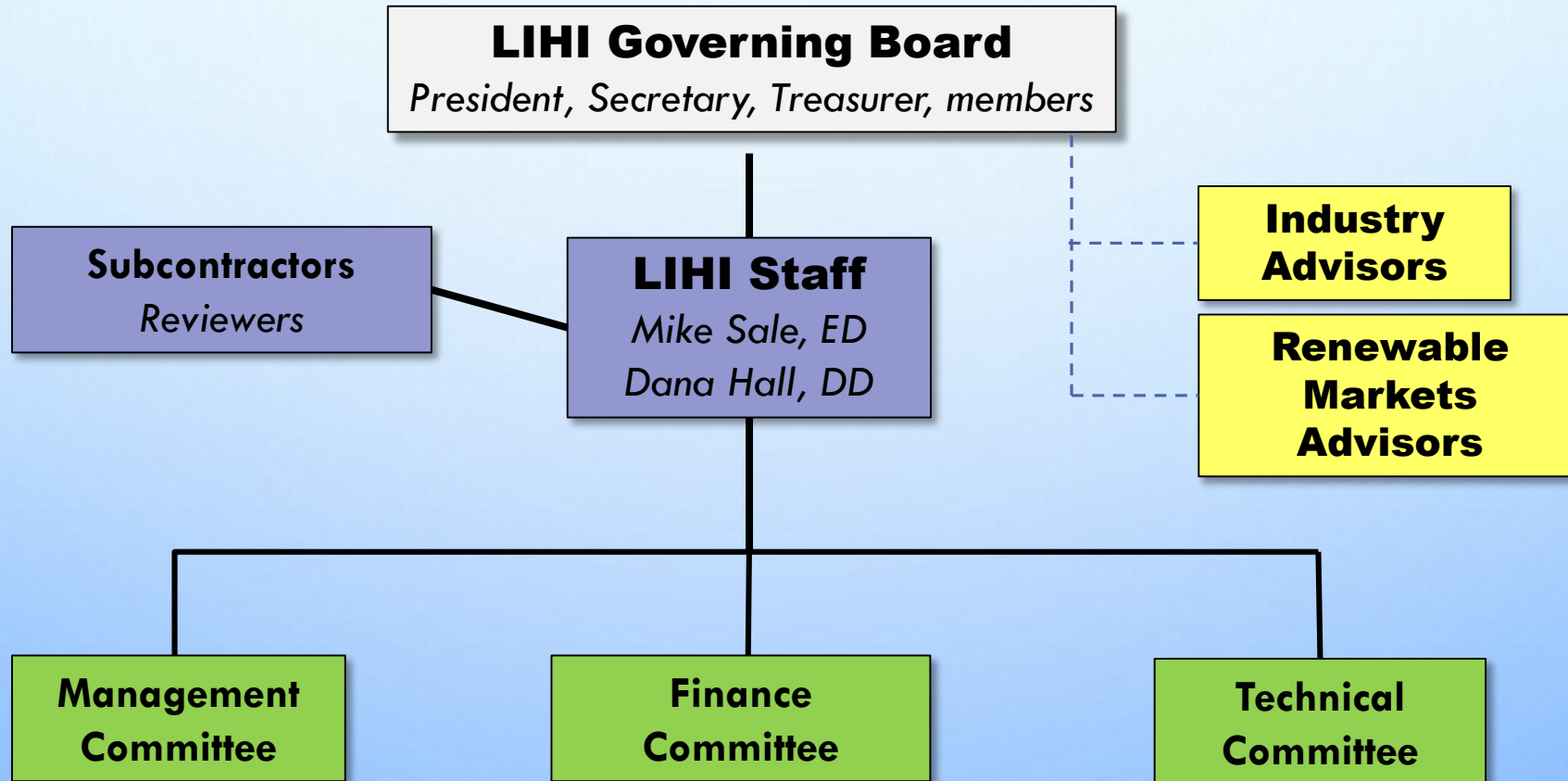
To date, LIHI has Issued 121 certificates to facilities at ~172 dams, in 28 states.

The total capacity of LIHI-certified hydropower projects is ~4.4 GW.

Low-impact facilities are both big and small (% of certifications to date)



LIHI IS THE COMBINATION OF BOARD, STAFF, AND ADVISORS



LIHI GOVERNING BOARD

RICHARD ROOS-COLLINS (PRESIDENT), WATER & POWER LAW GROUP

JACK PALMER (TREASURER), KLEINSCHMIDT (RETIRED)

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PIERRE BULL, NATURAL RESOURCES DEFENSE COUNCIL

STEVE MALLOCH, AMERICAN RIVERS

GLENN CADA, ORNL/RETIRED

TARA MOBERG, THE NATURE CONSERVANCY

SHAWN SEAMAN, MARYLAND DEPARTMENT OF NATURAL RESOURCES

**[Union of
Concerned Scientists]**

**The Nature
Conservancy** 
Protecting nature. Preserving life.™



American Rivers
Thriving By Nature

LIHI BYLAWS: GOVERNING BOARD

> 50% environmental NGOs

LIHI HAS DIVERSE ADVISERS

HYDROPOWER INDUSTRY ADVISORY PANEL

BRENDAN MCCARTHY (CO-CHAIR) PORTLAND
GENERAL ELECTRIC

SEAN FAULDS (CO-CHAIR), BROOKFIELD
RENEWABLE ENERGY GROUP

SARAH HILL-NELSON, BOWERSOCK MILLS
HYDROELECTRIC CO.

SHAWN KENISTON, TRANSCANADA

ELIZABETH ABLOW, SEATTLE CITY LIGHT

DEB MALIN, BONNEVILLE POWER ADMINISTRATION

DAVE YOULEN, EAGLE CREEK RENEWABLES

RENEWABLE MARKETS ADVISORY PANEL

PHILIP RAPHALS, HELIOS CENTRE (QUEBEC)

JENNIFER MARTIN, CENTER FOR RESOURCE SOLUTIONS

IAN MCGOWAN, 3 DEGREES

OMAY ELPHICK, GRAVITRY RENEWABLES

LIHI CERTIFICATION APPROACH

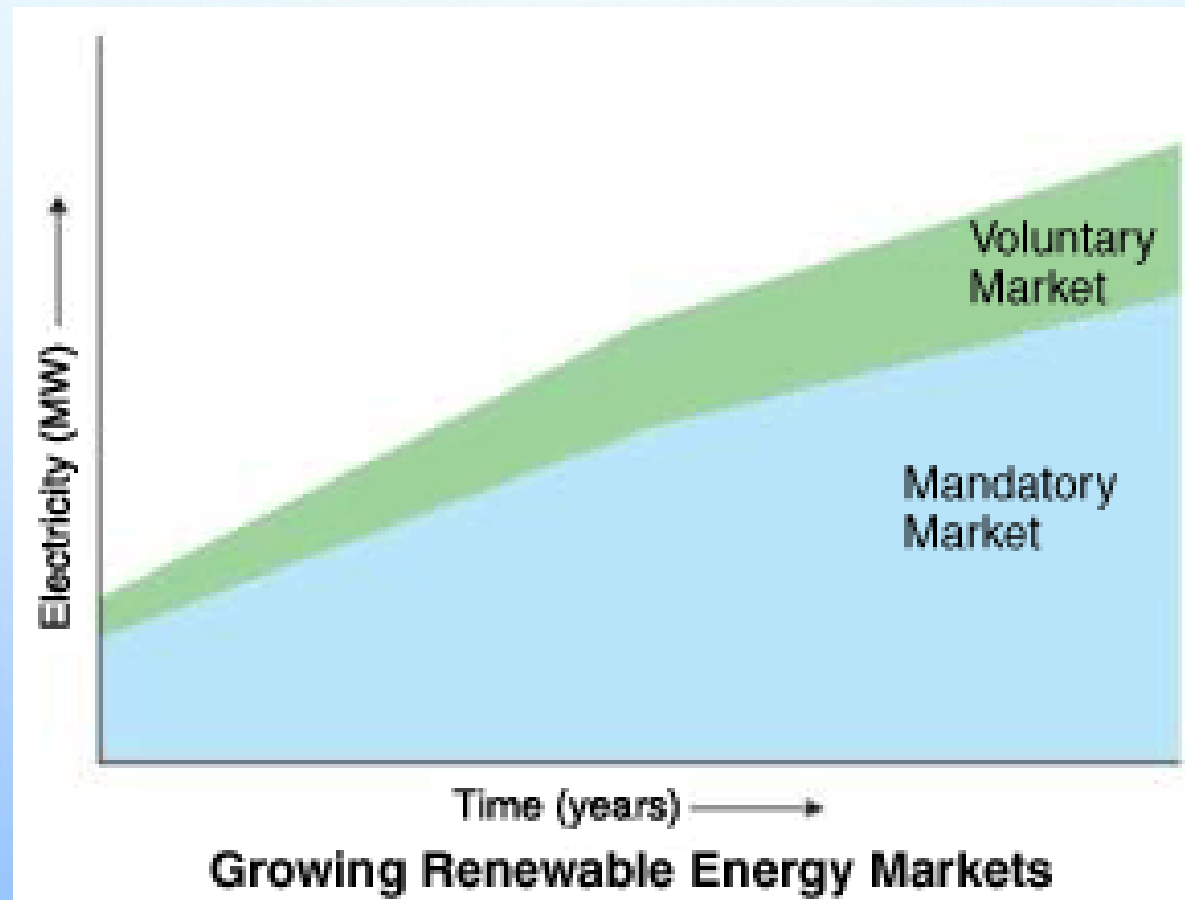
- EXISTING FACILITIES (AS OF AUGUST 1998) AND INCREMENTAL NEW DEVELOPMENT AT EXISTING DAMS IN THE US ARE ELIGIBLE
- FACILITIES RECOMMENDED FOR DAM REMOVAL ARE NOT ELIGIBLE
- SEVEN CRITERIA MUST BE SATISFIED:
 - FLOWS
 - WATER QUALITY
 - FISH PASSAGE AND PROTECTION
 - WATERSHED PROTECTION
 - PROTECTION OF THREATENED AND ENDANGERED SPECIES
 - CULTURAL RESOURCE PROTECTION
 - RECREATIONAL RESOURCE PROTECTION

LIHI CERTIFICATION CRITERIA CHANGES

<http://lowimpacthydro.org/low-impact-criteria/>

- 8/13/14 DRAFT REVISION CERTIFICATION CRITERIA RELEASED FOR PUBLIC COMMENT. VERY STRONG PUBLIC PARTICIPATION
- 11.20/14, REVISED CRITERIA APPROVED BY GB
- NEW HANDBOOK COMING
- FULL IMPLEMENTATION WILL NOT OCCUR BEFORE 2016
- FACILITIES DUE TO RENEW IN 2015 WILL BE REVIEWED UNDER THE PREVIOUS CRITERIA

RENEWABLE ENERGY MARKETS





What Is a Renewable Energy Certificate?

HAVE SOLAR AND WIND ACHIEVED GRID PARITY?

The New York Times

<http://nyti.ms/1yJq2r0>



ENERGY & ENVIRONMENT

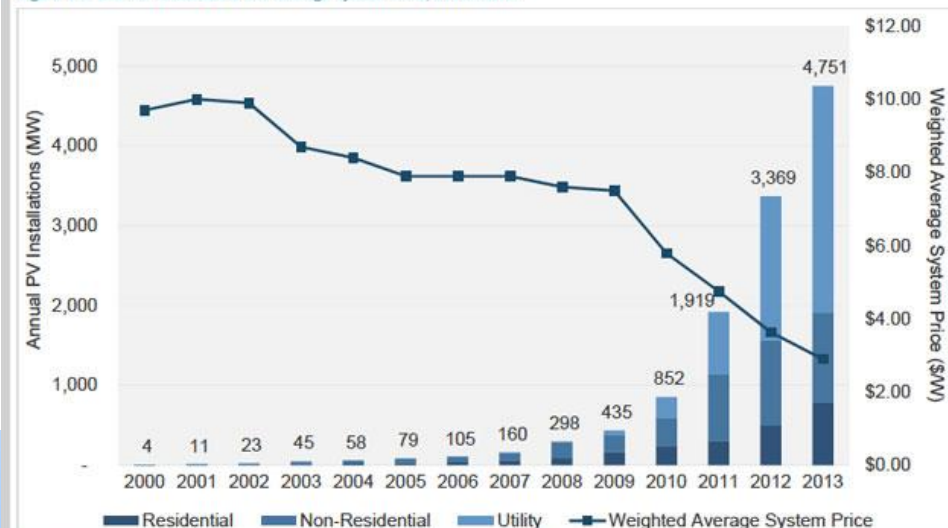
Solar and Wind Energy Start to Win on Price vs. Conventional Fuels

By DIANE CARDWELL NOV. 23, 2014

For the solar and wind industries in the United States, it has been a long-held dream: to produce energy at a cost equal to conventional sources like coal and natural gas.

That day appears to be dawning.

Figure 2.1 U.S. PV Installations and Average System Price, 2000-2013



Installations (MW)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Residential	1	5	11	15	24	27	38	58	82	164	246	304	494	792
Non-Residential	2	3	9	27	32	51	67	93	200	213	339	831	1,072	1,112
Utility	0	3	2	3	2	1	0	9	16	58	267	784	1,803	2,847
Total Installations	4	11	23	45	58	79	105	160	298	435	852	1,919	3,369	4,751

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GTM RESEARCH

SEIA
Solar Energy Industry Association

THANK YOU LIHI CERTIFICATE HOLDERS



53 – Bear River
61 – Cutler
62 – Ashton
69 – North Umpqua
103 – Prospect No. 3



25 – Pelton Round Butte
33 – Willamette Falls

PANELISTS

- **JULIE PEACOCK**, *ENERGY POLICY ANALYST*, OREGON DEPARTMENT OF ENERGY
- **BRENDAN MCCARTHY**, *STATE GOVERNMENT AFFAIRS*, PORTLAND GENERAL ELECTRIC CO.
- **JENNIFER MARTIN**, *EXECUTIVE DIRECTOR*, CENTER FOR RESOURCE SOLUTIONS
- **JAMES CRITCHFIELD**, *DIRECTOR*, GREEN POWER PARTNERSHIP, U.S. ENVIRONMENTAL PROTECTION AGENCY