STATE OF NEW YORK PUBLIC SERVICE COMMISSION

CASE 15 E 0302 In the Matter of the Implementation of a Large Scale Renewable Program.

Low Impact Hydropower Institute Comments on the Clean Energy Standard Cost Study

Introduction

The Low Impact Hydropower Institute appreciates the opportunity to submit comments on the Commission's *Clean Energy Standard White Paper - Cost Study* ("Cost Study") which was submitted to the New York State Public Service Commission ("Commission") on April 8, 2016. LIHI strongly supports Governor Cuomo's goal of meeting 50% of the state's energy needs with renewable sources by 2030 as well as the adoption of a Clean Energy Standard ("CES") as a method of achieving this goal. LIHI also supports the comments made by organizations supporting hydropower and its societal benefits[1] and the inclusion of low-impact certification as a qualifying factor for inclusion in the CES[2]. The Cost Study reviews the overall cost to NY rate-payers of implementing a CES by weighing development costs, impact to rate-payer electricity bills, and societal benefits including the avoidance of greenhouse gas (GHG) emissions in most of the Tier analysis. The Cost Study concludes that the CES will result in a net benefit to New York residents. For the reasons stated below, LIHI believes that the benefits from existing low-impact hydropower resources have been underestimated or possibly not considered adequately. Hydropower potential may have been underestimated and its limitations for future technology cost reductions and licensing constraints not thoroughly considered. LIHI suggests that a more comprehensive review of

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[1] Ampersand Hydro LLC, "Ampersand Hydro Comments to CES.pdf" (March 14, 2016), page 3-4. Brookfield Renewable Energy Group, "Brookfield White Paper Comments.pdf" (April 22, 2016), page 4. Gravity Renewables, Inc., "NY CES Gravity Comments.pdf" (April 22, 2016), page 2-3. Independent Power Producers of New York (IPPNY); "IPPNY Initial Comments on CES.pdf" (August 12, 2015), page 25.

[2] Brookfield comments page 4. IPPNY comments page 25.

hydropower would result in a net benefit to consumers, rather than a net cost as has been asserted by the Cost Study as regards Tier 2B specifically.

About the Low Impact Hydropower Institute

The Low Impact Hydropower Institute ("LIHI") is a nonprofit corporation whose purpose includes: 1) setting criteria for characterizing hydropower facilities as low-impact, thereby creating a credible standard for consumers to use in evaluating hydropower; 2) conducting a program to certify dams that meet these criteria with the goal of reducing the environmental impacts of hydropower generation; and 3) making information about the environmental effects of power generation available to the public. Since 1999, LIHI has operated the premier nationally accepted certification program for low-impact hydropower in the United States[3]. Through an open and public process, including input from the hydropower industry, LIHI has recently strengthened its criteria as published in its most recent Certification Handbook.[4] The new handbook includes a longer list of alternative standards for use in passing LIHI criteria, options to extend certification to ten years, and a lower cost for "very low-impact" hydropower facilities. These additional alternative standards allow a broader path to certification for hydropower facilities, including those that do not fall under the jurisdiction of Federal Energy Regulatory Commission ("FERC").

The LIHI Certification Program has established its credibility over 15 years of application. LIHI by-laws require that the Board of Directors be composed of at least 50% representatives from environmental NGOs, and the remainder from the hydropower industry and other stakeholders. NGO representatives have been instrumental in the development of LIHI's science-based approach which examines flow regimes, water quality, watershed protection, fish passage (both upstream and downstream), threatened and endangered species protection, cultural resource protection, and water-based recreation. Only hydropower dams built prior to August, 1998 are eligible for certification. However, generation installed later than

[3] LIHI Certification is the definitive criteria for use in state RPS' in Massachusetts, Delaware, Pennsylvania, Oregon, New Jersey and Vermont through either statute or regulations and is the standard used by Green-E for US participation in its renewable energy credit programs.
[4] http://lowimpacthydro.org/wp content/uploads/2014/08/2nd edition handbook 20160307 FINAL CLEAN.pdf

August, 1998 is eligible for certification if it does not involve construction of a new dam or new diversions. Sometimes, these facilities involve newer technologies such as hydrokinetic generation or turbines placed in conduits. The LIHI Certification Program has broad industry stakeholder support ranging from small family operators to independent power producers to load-serving entities; both investor and publicly owned. The LIHI Program also provides an opportunity for interested members of the public to participate and comment on all applications for LIHI certification.

To date, LIHI has certified hydroelectric facilities in 23 states[5], totaling over 4.8 GW of LIHI certified capacity, with 373 MW in NY alone. LIHI does not distinguish by facility size; there are facilities under 1 MW and others over 700 MW that have been certified. LIHI provides the standard used by several state renewable portfolio standards ("RPS") programs, including Massachusetts, Delaware, Pennsylvania, Oregon, Vermont and New Jersey,[6] providing a pathway into RPS for projects throughout New England, the PJM Interconnection, and the Western Electricity Coordinating Council control areas. A LIHI Certified® marker is already incorporated into the Midwest Renewable Energy Tracking System ("M RETS"), the New England Power Pool Generation Information System ("NEPOOL GIS"), the North American Renewables Registry ("NARR"), and the Western Renewable Energy Generation Information System ("WREGIS"). PJM Environmental Information Services ("PJM EIS") is also considering the addition of a LIHI Certified marker to their PJM EIS Generation Attribute Tracking System ("PJM EIS GATS"). Including this marker in New York's NYGATS is also under consideration.

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[5] LIHI has certified facilities in the following states: AK, CT, GA, ID, KS, KY, MA, ME, MT, NC, NE, NH, NY, OR, PA, RI, TN, UT, VA, VT, WA, WV, WY.

[6] Delaware: Delaware Public Service Commission Order No. 8139 http://depsc.delaware.gov/orders/8139.pdf
Massachusetts: Green Communities Act of 2008 (M.G.L. c. 25A, § 11F 225 CMR 14.00); Department of Energy Resources http://www.mass.gov/courts/docs/lawlib/220229cmr/225cmr14.pdf
Pennsylvania: ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT, P.L. 1672, No. 213
Oregon: http://www.oregon.gov/energy/P-I/docs/Hydroelectricity%20and%20the%20Oregon%20RPS%20Fact%20Sheet.pdf
Vermont: http://legislature.vermont.gov/assets/Documents/2016/Docs/BILLS/H-0040/H-0040%20As%20Passed%20by%20Both%20House%20and%20Senate%20Unofficial.pdf
New Jersey: http://www.njleg.state.nj.us/2012/Bills/S2000/1925_R4.PDF

Comments on the Clean Energy Standard White Paper – Cost Study

1) Hydropower development costs may fall over the course of the study period

In the Cost Study, it is anticipated that because hydropower is a "mature" technology, its costs will not decrease over time and are therefore held flat in the analysis[7]. LIHI would like to bring to the Commission's attention that the Department of Energy ("DOE") is expected to release a report in July, 2016 that will present a technology development roadmap for growing installed hydropower throughout the country, including methods of reducing the costs of new development. The DOE outlined its intentions in the 2015 Hydropower Vision Task Force Charter[8]. The effort included stakeholders in every aspect of the hydropower life cycle. A Senior Peer Review Group was established to provide executive guidance and is composed of people representing independent power producers, environmental NGOs, new hydropower developers, utilities, trade organizations, consultants, OEMs, state organizations, and regulatory/resource agencies. It established task forces, similarly diverse in makeup, to address technology, environmental and regulatory considerations, markets, project development, and grid integration, among others. It is expected that this intensive effort will result in concrete recommendations that will have a downward effect on development costs. The U.S. Congress is providing significant new funding to DOE to carry out its hydropower development initiative.

2) Federal licensing requirements are not applied to small hydropower in the same way that they are to large hydropower

The Cost Study notes that site permitting and licensing are often the largest barriers to hydropower development[9]. LIHI would like to point out that due to legislative

[7] Cost Study, page 173
[8] DOE Hydropower Vision: Task Force Charter V2 06/09/2014
[9] Cost Study pages 177, 179

changes in 2013[10], hydropower facilities that are less than 10 MW are often eligible for licensing exemptions[11]. These exemptions are granted in perpetuity. Small facilities are still subject to state and federal permitting requirements, such as water quality certification and fish and wildlife review and process. Resource agency recommendations are mandatory, but only if those agencies choose to participate in exemption proceedings (in the past, agency participation has been less active in exemptions). Pending the outcome of legislative changes that are currently working their way through Congress, certain small hydropower facilities may be excluded from FERC jurisdiction entirely. In contrast, low-impact certified hydropower is a third party verification of a given facility's overall environmental impacts. LIHI considers project operations regardless of whether those projects are FERC licensed or not, providing a comprehensive view of a given project's approach to the environment. Furthermore, the legislative changes that were passed in 2013[12] allow FERC to convert some licenses to exemptions when they are relicensed – that would mean that a thorough environmental review would never happen again.

3) Existing hydropower has significant benefits that should be considered in the Cost Study

For reasons that are not made entirely clear, the Cost Study omits the value of positive externalities, including carbon avoidance, in its evaluation of Tier 2B[13]. While considered in the evaluations of other technologies, and in its evaluation of hydropower in Tier 1 and Tier 2A, the social cost of carbon is not considered in Tier 2B. In addition, since the Cost Study does not go into detail as to what benefits were considered for hydropower in Tier 1 or 2A, it is possible that the Cost Study omits consideration of benefits such as baseload capacity, peaking ability (the only

[10] *An Act To Improve Hydropower*, PUBLIC LAW 113–23—AUG. 9, 2013, https://www.congress.gov/113/plaws/publ23/PLAW-113publ23.pdf
[11] FERC licensing data from Oct-2015 show 61 exemptions in NY (25 of which are < 1 MW), and 108 licenses in NY (25 of which are < 1 MW). For more information on exemptions see FERC website at: https://www.ferc.gov/industries/hydropower/gen-info/licensing/exemptions.asp
[12] *An Act To Improve Hydropower*, PUBLIC LAW 113–23—AUG. 9, 2013, https://www.congress.gov/113/plaws/publ23/PLAW-113publ23.pdf
[13] Cost Study, page 83

renewable with this capability), recreational opportunities, flooding moderation, support to fish habitat, and migration both directly and indirectly, and the monetary support through taxes and payments in lieu of taxes to the New York communities they inhabit. Many times, these hydropower resources are the largest single tax payer for small rural communities. Hydropower facilities that are located at older dams provide a unique economic resource that will contribute to future rehabilitation.

In its comments on the CES White Paper, Ampersand Hydropower included an estimate of avoided emissions from small hydropower in New York. Their estimate was 1.7 million tons of avoided carbon in 2014. SOx and NOx, particulate matter, and other pollutants were also avoided by these facilities as compared with their fossil counterparts[14].

With an estimated social cost of carbon at $36-69 per ton[15], it is certainly possible to include the concrete benefits of these facilities. Low-impact certified hydropower ensures an additional level of environmental and social benefits above and beyond this single metric.

The Cost Study references the Department of Public Service's Environmental Impact Statement regarding the proposed CES which specifically outlines the benefits of the CES: public health, climate change, ecosystem services benefits, fuel diversity, and economic development[16]. Low-impact hydropower in particular maximizes these benefits by addressing concerns beyond the threat of rising temperatures. Low-impact hydropower is a partner in ecosystem sustainability, maximizing such benefits through our comprehensive set of criteria. LIHI certification could become more important as the environment warms and additional threats to riverine

[14] Ampersand Hydro Comments, page 3
[15] https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html: using 3% average discount rate
[16] Cost Study, page 29; NY Department of Public Service Draft Environmental Impact Statement, page 9-1 – 9-2

ecosystems and the communities along them emerge. LIHI requires certification every five to ten years, providing a checkpoint for detecting changes due to climate change and encouraging the adjustment of mitigation accordingly.

Tier 2B analysis in the Cost Study presumes a REC price of $2.25[17] per MWh, while currently, Massachusetts Class 2 RECs are trading around $26-27 per MWh, according to Jonathan Burnston, partner at Karbone Inc. This is close to the Alternative Compliance Payment ("ACP") which is set at $27.50 per MWh[18]. While there may be barriers to deliverability, the structure as proposed in Tier 2B may present facilities with the choice of either upgrading to export or retiring.

Tier 2B analysis in the Cost Study results in a net cost to ratepayers[19]. However, if hydropower's total benefits are properly accounted for, the result should be a positive net benefit, as was proven in the Cost Study's analysis of other Tiers. Even when adjusted to reflect more realistic Tier 2B rates, the result should be a net benefit to consumers.

4) Hydropower resources and potential may be misrepresented

Due to the adjustments made to existing reports on hydropower potential in the US and in NY specifically, hydropower potential may be under-represented. At the same time, targeting a REC price for Tier 2B not much more than assumed transaction costs[20] would not necessarily provide adequate payment for hydropower's environmental and social benefits, potentially resulting in retirements.

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[17] Cost Study, page 83
[18] For MA Class 2 ACP prices see: http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/rps-aps/retail-electric-supplier-compliance/alternative-compliance-payment-rates.html
[19] Cost Study, page 91
[20] Cost Study, page 267

The Cost Study outlines its adjustments made to the ORNL Hydropower Potential Study in high-level terms[21]. While the ORNL study may have overestimated the generation at currently non-powered dams by assuming use of 100% of water flow, the study was rooted in scientific methodology resulting in a realistic assessment of potential. However, the ORNL study excluded sites that would produce less than 1 MW of power. The survey used in the Cost Study to triple the number of potential sites, as noted in the Cost Study[22], did not consider permitting or siting restraints. The decision to therefore reduce the number of sites by half would need to be further understood.

The result of low Tier 2B REC prices could very well be the retirement of baseload renewables. Coupled with low wholesale energy prices, the Tier 2B structure and analysis not only takes these facilities for granted, but it also creates a structure that may encourage either exports or retirements. Persistent calls for dam removals are another factor facing hydropower facilities that are due for FERC relicensing. The evaluation of whether to proceed with relicensing considers the cost of relicensing versus the cost of retirement, including potential dam removal and its associated cost. Abandonment is also a risk whose cost would be born by New York rate-payers.

5) Low-impact certified hydropower represents an objective science-based method to qualifying hydropower resources

A number of organizations have expressed concerns over including hydropower without limitation to size and hydropower subsidized by governments[23]. In addition, organizations have expressed concerns about hydropower's maturity and therefore its inclusion at all into the CES. As stated in our reply comments to the CES White Paper, LIHI has found that the size of a hydroelectric facility alone is not an

[21] Cost Study, page 177
[22] Cost Study, page 176
[23] See comments to CES White Paper submitted by ACE NY ("and Others"), Sierra Club, IPPNY, RENEW.

accurate determinant of environmental effect[24]. The aggregate environmental footprint of hundreds of small hydro facilities that are not well operated is less preferable than the environmental footprint of a single large facility with equivalent energy output that is successful at passing migratory fish, supporting healthy river flows and water quality, protecting the watershed, threatened and endangered species, and preserving cultural resources and the public's access for recreation. In addition, the CES criteria of "run of river" also unnecessarily omits many facilities that have been designed with environmental needs in mind. These low-impact certified, non-run-of-river facilities also provide an array of grid benefits including dispatchability and black start capabilities.

Using low-impact certified hydropower as a qualification to participation in the CES would have the intended effect of limiting hydropower's participation but would do so by maximizing positive externalities through comprehensive criteria.

Conclusion

The overall approach taken with regard to the hydropower component of the CES appears biased in outdated assumptions that 1) hydropower will exist regardless of our actions and therefore requires little support, 2) hydropower is an outdated technology that will never have cost reductions regardless of how much new potential is tapped, and 3) hydropower does not deserve adequate assessment. However, without proper compensation for all its benefits (in the case of low-impact hydropower, benefits far in excess of other renewable alternatives) this baseline renewable resource may in fact start to decline. The assessment of hydropower in the Cost Study ignores the progress of low-impact certified hydropower and efforts underway to expand hydropower in the US.

Tier 2B hydropower analysis should be consistent with other Tiers and include an assessment of benefits, including the social cost of carbon. Doing so should result in

[24] For a discussion on hydro's various impacts see: http://www.csmonitor.com/Environment/Energy/2016/0513/Hydropower-s-next-act-becoming-a-less-controversial-renewable

a net benefit, not cost as is currently shown in the Cost Study. Finally, low-impact certified hydropower maximizes the net benefits to New York residents while also limiting participation in a scientifically based manner.

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Respectfully submitted,

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