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Mr. Michael Pulskamp
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January 27, 2011

Mr. Pulskamp,

The National Hydropower Association[1] ("NHA") appreciates the opportunity to provide the following comments on the Bureau of Reclamation's ("Reclamation") *Draft Hydropower Resource Assessment at Existing Reclamation Facilities ("Assessment")* released in November 2010.

NHA applauds the work Reclamation has undertaken as part of the 2010 Federal Memorandum of Understanding (MOU) for Hydropower to update its review of power potential at existing Reclamation facilities.[2]

While the Assessment highlights opportunities for growth on Reclamation's system, NHA and the industry were surprised by the comparatively low number of megawatts reported. From discussion with industry experts, we believe the potential is even greater than 260 MW. NHA views the Assessment as a good first step, and we urge continued analysis.

Congress and the Administration, as well as the states, have set ambitious energy goals for the country, seeking the short and long term benefits of significantly increased renewable energy generation, such as reduced emission of greenhouse gases and air pollutants. NHA believes that hydropower can and should play a leading role in meeting these goals by bringing significant new renewable energy generation online.

As the federal system makes up about half of the hydropower generation in the United States today, and as there is significant existing non-powered federal infrastructure that could be converted to generating resources, NHA and the hydropower industry believe Reclamation (as well as the Corps of Engineers) is uniquely situated to support the deployment of new hydropower resources to meet these goals.

General comments are provided in the following section. This letter also includes specific responses to the details of the Assessment.

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[1] NHA is a non-profit national association dedicated exclusively to advancing the interests of the U.S. hydropower industry, including conventional, pumped storage and new hydrokinetic technologies. NHA's membership consists of more than 180 organizations including public utilities, investor owned utilities, independent power producers, project developers, equipment manufacturers, environmental and engineering consultants and attorneys.
[2] 2010 Federal Memorandum of Understanding for Hydropower, May 24, 2010.

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Overview

In general, NHA is pleased to note that this Assessment determined an increase in hydropower potential over the previous Reclamation assessment released in 2007 as part of the Section 1834 report prepared in accordance with the Energy Policy Act of 2005[3]. Though the 260 MW of potential capacity represents a more than 300 percent increase over the 52.7 MW in potential capacity identified at Reclamation facilities in the Section 1834 report, NHA believes that this amount remains a conservative estimate and does not document the full range of opportunities available on Reclamation's system.

NHA appreciates that the Assessment clearly states that it is not a feasibility study. (It is important to emphasize, as the Assessment does, that it utilized "broad power and economic criteria and it is only intended for preliminary assessments of potential hydropower sites."[4] Hydropower project development is a complex and detailed site-specific venture, with the individual characteristics of the site playing a paramount role. The Assessment acknowledges that "[h]ydropower plants can be designed to meet specific site characteristics" and that "[d]esign features can significantly affect the power production and costs of a project."[5] . As such, readers of the Assessment should be aware that more detailed study of individual sites may result in a different conclusion than that reached by the Assessment. However, utilizing the document as a screening level assessment of hydropower projects is a good start.

Finally, the updated Assessment, by its terms, was undertaken only to evaluate potential new projects at existing non-powered Reclamation dams. To more fully implement the 2010 MOU, NHA encourages Reclamation to assess and make available (if it has not done so already) data for upgrades or additions of capacity at existing hydropower projects throughout Reclamation's system. With this data on upgrades and backlogged O&M projects, Reclamation would be able to present a more complete picture of its potential contribution to increased hydropower generation. These issues were explored in the 2007 Section 1834 report, but NHA believes the analysis deserves a second look. With new turbine technology and other advancements, such upgrades and expansions have the dual benefit of increased power and improved environmental performance.

Specific comments on the Assessment methodology

The following comments were developed by NHA through a staff review of the Assessment and in consultation with industry members with expertise in project identification, screening, feasibility and due diligence review. In fact, several of NHA's member companies have engaged in analysis of Reclamation infrastructure for potential development by non-federal entities.

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[3] Section 1834 of the Energy Policy Act of 2005 required the Secretary of the Interior, the Secretary of the Army, and the Secretary of Energy to "jointly conduct a study assessing the potential for increasing electric power production at federally owned or operated water regulation, storage, and conveyance facilities."
[4] Draft Hydropower Resource Assessment at Existing Reclamation facilities, November 2010. Section 4.3, p. 4-3.
[5] Ibid. Section 4.4, p. 4-4.

Data is incomplete and may also underrepresent potential.

In Table ES-1, the Assessment indicates that Reclamation was unable to obtain hydrological data for 92 of the 530 sites analyzed. This represents a significant data gap of nearly 18 percent of the total possible sites. NHA commends the efforts of Reclamation staff in utilizing several data sources for the Assessment. However, we urge Reclamation to examine how it may locate the necessary information to evaluate these remaining sites, and to include funding to close this data gap as part of its FY 2012 budget proposal. A partnership with the Department of the Interior, through the United States Geological Survey's National Streamflow Information Program, may be able to provide the data to address this issue.

Our members also have concerns that the Assessment underestimates the potential capacity of projects. To estimate plant capacities and associated energy production, the Assessment "develops flow and net head exceedance curves and sets design flow and design net head at a 30-percent exceedance level to calculate installed capacity."[6] Using the 30-percent exceedance flow and associated head to determine capacity could under-predict the best economic capacity for sites with skewed head and flow duration curves.

For example, an independent analysis by an NHA member company found that technical potential of one project, Cle Elum Dam in Washington State, was nearly three times that of the potential reported in the Assessment. Certainly, this is only one example of a difference in analysis between Reclamation and the industry. While this difference may not apply to all sites addressed in the Assessment, it does suggest that the sites warrant further investigation, and perhaps collaboration with industry experts, to provide the most complete picture of the potential for hydropower development at Reclamation facilities.

Additionally, Table ES-1 demonstrates that 182 sites contained no hydropower potential whatsoever. The Assessment states that at these sites "[l]ocal area knowledge or available hydrological data indicated that the site does not have hydropower potential because flows or net head are too low for hydropower development."[7] This number represents approximately 34 percent of the total sites.

Generally , this summary conclusion analysis could be accurate, but for NHA it remains a surprisingly high number and begs several questions. Is the available hydrological data for these sites current and accurate? Is there a need to update this data? The Assessment would seem to indicate that projects at these sites are not viable utilizing conventional, traditional technology. At a minimum, there appears to be a research and development opportunity for which the Reclamation could partner with the Department of Energy to investigate and test new applications that take advantage of the multitude of low-head or low-flow sites. In fact, Reclamation staff have suggest ed that Reclamation could play a lead role in creating a technology demonstration park utilizing existing hydraulic and electrical infrastructure to support the evolution of new, low head technologies that could be specifically used in irrigation canal drops and other water delivery systems.

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[6] Ibid, Executive Summary, p. ES-2.
[7] Ibid, Executive Summary, p. ES-3.

Economic analysis may contain imperfect cost assumptions

NHA also is concerned with the economic analysis used to produce the Assessment.

First, the cost estimates developed in the Assessment are based on a regression analysis of the cost of installed hydropower projects completed by the Idaho National Lab (INL) in 2002. While this represents the most recent government data available, NHA notes that it is now almost 9 years old and that the economic climate in 2011 varies dramatically from that in 2002. Because of this, industry members raise the possibility that the INL cost data does not now accurately reflect actual facility development, design, and construction costs, and that real-world experience provides a better gauge of these costs.

For example, INL cost factors have been escalated by 30 percent to account for inflationary cost increases occurring since 2002. Industry members believe this escalation factor may be too high based on the recent history of inflation rates experienced over the last several years and the existing economic climate.

Additionally, the Assessment's assumptions on mitigation costs may need to be reconsidered. In section 3.3.2 of the Assessment, Reclamation discusses assumptions related to mitigation costs for potential hydropower projects stating:

> "Other costs that may apply, depending on the specific site, include fish passage requirements, historical and archaeological studies, water quality monitoring, and mitigation for fish and wildlife, and recreation. The magnitude of the above mitigation costs is dependent on the installed capacity of the project. In general, mitigation costs would increase the larger the project…In general, mitigation costs are very site specific and should be reevaluated if a site is further analyzed. Mitigation costs could differ significantly than those presented in this analysis." (P.3-17)

Given that mitigation costs for hydropower are highly site specific, it may not be appropriate to assume that these costs are dependent on the installed capacity of the project. It might be more appropriate to increase the contingency on the construction costs to account for potential mitigation measures with the general belief that higher project construction costs correlate with larger project sizes better able to support mitigation expenses. Understandably, smaller projects have little margin to absorb significant mitigation expenses.

Assessment excludes important incentives from analysis

In the Assessment, Reclamation attempts to inventory and consider policy incentives that benefit hydropower development (p.3-14). While the Assessment explores several incentives, such as the Federal Production Tax Credit and specific state performance incentives, other critical financial incentives, specifically installation-based federal incentives, are not adequately addressed.

While it is true that such incentives can vary based on factors such as ownership and date of implementation, NHA believes that excluding these policies undervalues the role they play in supporting project development. Indeed, two programs in particular have proved to be valuable investment tools over the past few years. Programs like the Section 1603 "grants in lieu of tax credits" program and

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Clean Renewable Energy Bonds have provided over $570 million to private and public electric companies to expand and upgrade current hydro facilities since 2007.

Additionally, looking at the Benefit Cost Ratio that Reclamation employed in this analysis illustrates that an opportunity exists to further incentivize the development of clean, renewable and reliable hydropower resources. Sixty-five sites, totaling 210 MW of installed capacity, are identified as being most cost efficient based on Reclamation's scale. That number could be increased by more than 10 percent if the next group of cost efficient projects (those ranked between .5 and .75) were bolstered by stronger incentive policies. That's an additional 88,143 MWh a year in generation, enough to power almost 8,000 American households annually.[8]

Conclusion

NHA once again commends Reclamation on updating its review of non-federal hydropower development opportunities on existing non-powered Reclamation dams. The Assessment highlights several key issues:

1) maximizing existing infrastructure is low-hanging fruit to meet the goal of developing more U.S. renewable energy resources;

2) the federal hydropower system, and in particular Reclamation, has an important role to play in realizing this untapped potential;

3) incentives for development can expand the universe of hydropower projects that are economically viable.

4) continued study of hydropower potential in general, and federal potential in particular, is necessary to fill data gaps and present the best information and most accurate picture of growth opportunities.

Thank you again for this opportunity to comment. NHA hopes that these comments provide useful recommendations to improve upon the Assessment methodology. The Association stands ready to work with Reclamation and other federal agencies to expand hydropower generation in the United States and meet the administration's renewable energy goals.

Sincerely,

Linda Church Ciocci
Executive Director

[8] Based on EIA estimation of annual average household electricity consumption of 11,040 kWh.