

Pumped Storage Hydropower Challenges - Solutions: National Hydropower Association Announces Policy Paper



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The National Hydropower Association (“NHA”) announced the submission of a Pumped Storage Hydropower (“PSH”) policy paper that identifies the challenges and solutions related to its development in the United States.

The PSH policy paper was submitted as part of the International Forum on Pumped Storage Hydropower and the coauthors include:

- Cameron Schilling
- Deb Mursch
- Dhruv Bhatnagar

The paper provides an overview of the United States’ electricity market including generation mix and evolution. It states that renewable resources will continue to supply an increasing share of electricity. Coal, natural gas and nuclear resources are stated to be expected to see an increasing number of retirements.

The status of pumped storage and its development potential is addressed. It is noted that storage hydropower currently provides 93 percent of the United States energy storage capacity (22.9 GW’s). PSH is described as a generation asset as opposed to transmission.

Existing PSH facilities are stated to be experiencing greater utilization in areas with increased variable renewable energy resources. The activities this involves include:

- Increased pumping during the day
- Additional starts and stops
- Increased evening ramping/condensing operations

Concern is expressed that PSH equipment is not designed for such operation and, therefore, maintenance costs/failure rates are increasing.

Challenges, barriers and emerging opportunities for PSH are stated to include:

- Licensing process (Federal Energy Regulatory Commission licensing can take three to five years, requiring significant investments, planning and studies)
- Demonstrating value over other technologies (assessing the value of PSH services as opposed to lithium batteries can be difficult)

- Valuation of network services and benefits (size, agility and location of new state-of-the-art PSH in some cases allows for the host grids to realize substantial performance benefits)
- Cost estimates can range from 1,700/kilowatt to 2,500/kilowatt
- Revenue uncertainty (PSH's traditional arbitrage model for revenues is being undermined by a changing load and supply mix)
- Inequitable policy treatment (PSH is not an eligible technology under most State Renewable Portfolio Standards)
- Environmental perceptions (PSH projects will have some environmental impact with open-looped projects typically having a greater impact than closed-looped or "off-river" projects)

The policy paper concludes with a series of eight recommendations to support the development of PSH projects.

A copy of the policy paper can be downloaded [here](#).