Pumped Storage Hydropower Siting Study Introduction and Overview Summary

Date: **6/13/24**
Time: **11:00 AM – 12:30 PM PDT**
Location: **Zoom online meeting**

Links: **https://www.energy.wsu.edu/CleanFuelsAltEnergy/PSHSiting.aspx**

Meeting Objectives

- **Introduce an information study designed to understand issues and interests surrounding the siting of pumped storage hydropower (PSH) in Washington**
- **Provide general overview of PSH**
- **Begin identifying participants' views on PSH siting factors, information needs, and questions**
- **Get input on the most useful types of open meetings (in the fall 2024)**
- **Describe opportunities to be involved and stay updated on the study**

Meeting Notes

Following an initial welcome, **Karen Janowitz (WSU Energy Program)** introduced the WSU Energy Program and the study team. She and the facilitator, **Tom Beierle (Ross Strategic)**, outlined the objectives and agenda for the day's gathering. Participants were then asked to take part in a PollEverywhere poll to test out the online polling software and to break the ice.

Study Overview and Introduction to PSH Technology

Karen gave an overview of the study and a brief introduction to pumped storage hydropower (PSH). She made it explicitly clear that this study is focused on the siting process of PSH and not focused on or promoting a specific project or projects. Karen also stressed that there will be a mapping component of the study, but that sensitive cultural information provided to the team will not be in the map.

Jeff Boyce (Meridian Environmental, Inc.) then gave an overview of the mapping component of the project and the source of the PSH siting data. He explained the use of a National Renewable

At-a-Glance Information

Hosted by Washington State University Energy Program in partnership with the Office of Tribal Relations at Washington State University, Meridian Environmental, and Ross Strategic

Approximately 90 people joined the meeting

Meeting participants represented a broad array of organizations and geographic locations

Meeting slides and a video recording are available on the study website

Energy Laboratory (NREL) study and mapping tool as the starting point for identifying potentially feasible locations for PSH in Washington.[1] Jeff outlined the criteria used in the study. He described the process for permitting PSH sites – making it clear that Federal Energy Regulatory Commission has jurisdiction over many water projects throughout the states.

Once the two presentations concluded, the webinar was opened to a Q&A period. Questions ranged from queries on how the duration of energy storage for PSH (10 hours) was calculated to the ratio of surface of reservoir needed per megawatt (MW) of power. A representative from the Yakama Nation thanked Karen for making it clear that this study is not connected to a specific project, but also stressed that these projects tend to "put a target" on the backs of Washington Tribes. A representative from the Confederated Tribes of the Colville Reservation echoed these sentiments, stressing the need for early Tribal participation. Other questions included lessons potentially learned from the Goldendale PSH project, how PSH might be impacted by Small Modular Nuclear Reactors (SMR), the size of PSH upper and lower reservoirs, the quality of soils needed to support PSH infrastructure, and other factors impacting PSH design and siting. Other questions were posed in the Q&A section and will inform the study moving forward.

Initial Participant Perspectives on PSH

PollEverywhere was used to elicit information from participants throughout the meeting. Based on the study overview and introduction to PSH technology, participants were first asked: **"In a word, what criteria, other than what you've heard today, do you think should be considered when siting PSH?"** (Figure 1.

Figure 1. Word cloud representing the most common terms used regarding criteria for siting of PSH.

[1] See: https://www.nrel.gov/gis/psh-supply-curves.html

Based on a grouping of similar responses, the top five suggested criteria (in order of frequency) were:

- Water availability and impacts
- Tribal and cultural sites
- Feasibility
- Habitat and endangered species
- Transmission and interconnection

A full list of responses is included in the Appendix.

Next, participants were asked: **"What more would you like to learn in future meetings about PSH?"** Based on participant upvoting and grouping of similar responses, future topics (in order of preference) were:

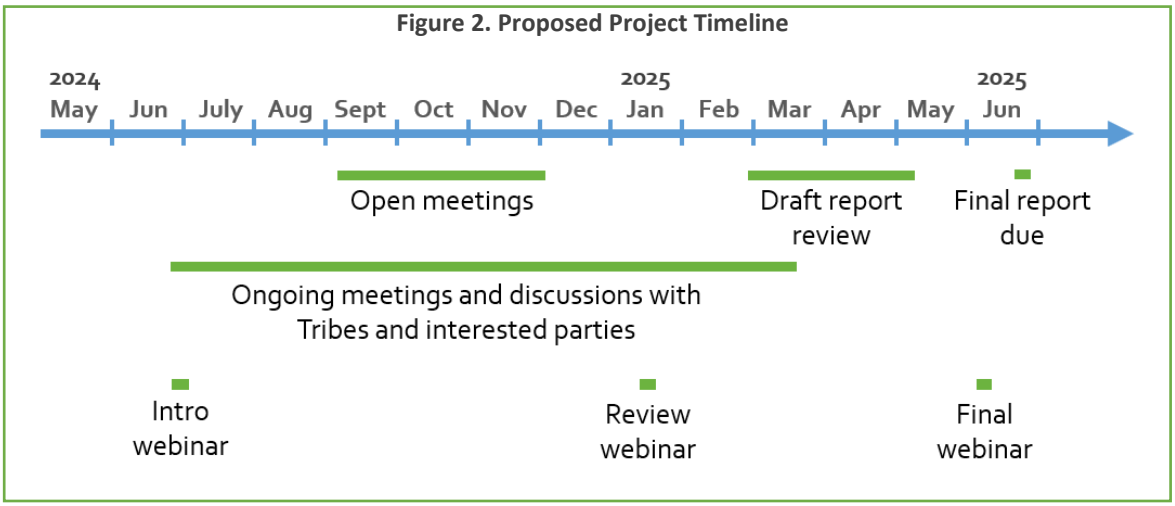
- Project benefits and impacts
- Tribal issues
- Amount of PSH needed and role in Washington's energy system
- Siting pathways and issues
- Comparisons and trade-offs with other storage options
- Information about developers and proposed projects
- Technical issues about PSH and site suitability
- Connection to infrastructure
- Community interest
- Construction carbon footprint

A full list of responses is included in the Appendix.

Future Meetings to Inform the Study

Karen outlined current thinking about the timeline of the projects (Figure 2). She emphasized that the core of the study is to "provide ample opportunities" for engagement of tribes, local governments, special purpose districts, land use and environmental organizations, and other interested stakeholders to understand issues and interests related to PSH. Engagement will include one-on-one meetings or interviews (as requested), small group Tribal or stakeholder discussions, and open meetings.

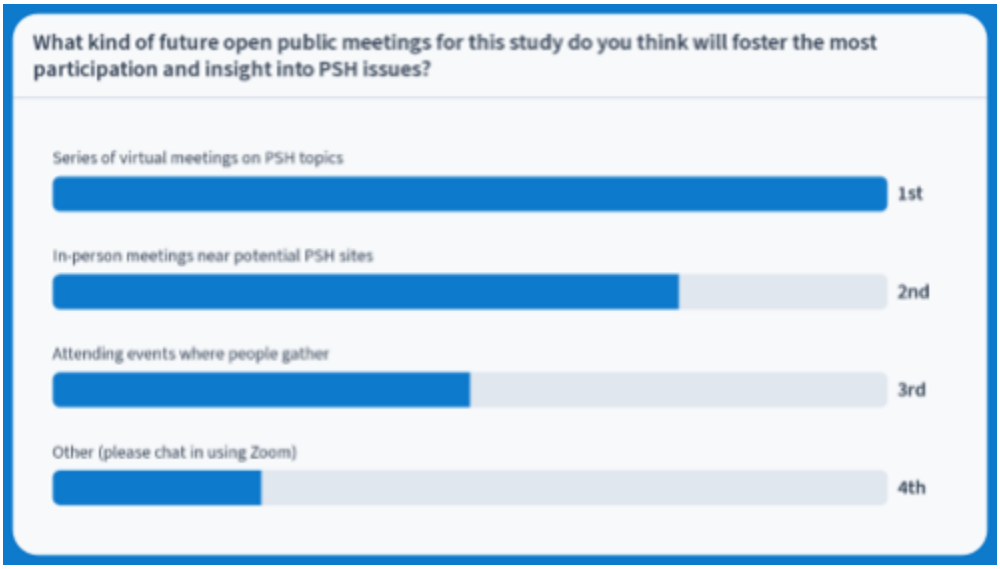
Figure 2. Proposed Project Timeline



To help guide the design of open meetings and outreach methods, participants were asked an additional series of poll questions about the format of future meetings, who else should be included in the study, and the topics participants want to learn about in future meetings.

When asked, **"What kind of future open public meetings for this study do you think will foster the most participation and insight into PSH issues?"** The majority of respondents (70%) ranked online meetings that focused on specific topics related to PSH as their top choice and most of the remaining respondents ranked it as their second choice (Figure 3).

Figure 3. Participant votes on what kind of future meetings should be held on PSH.



When asked **"Who else should we talk to?"** participants' top responses (in order of upvotes) were:

- Local and county governments
- Utilities
- Local residents and communities

- Site owners and developers
- Tribal government
- Land trust and conservation groups

Finally, participants were asked **"What else should we do to raise awareness about this study and encourage input?"** Top responses included engaging with United States Department of Energy and national labs, utilizing local traditional media, using social media, customer bill inserts, and connecting with prominent local individuals and organizations. Respondents suggested that emphasizing why storage is needed and potential economic opportunities related to PSH were topics that would attract people to the study.

Remaining Questions and Wrap Up

Participants were invited to ask final questions, which ranged from the types of soil and other features that affect the feasibility for PSH, to what the evaporation rates of a typical PSH reservoir are, to plans for Tribal engagement. Other questions focused on Federal vs. State regulation and advice on how to proceed with Tribal involvement. The questions that could be were answered, and notes were taken to follow up when needed. Karen wrapped up the meeting by providing everyone with her contact information and the study website, while thanking them for their participation. The meeting ended at 12:30 pm with thanks to all who attended.

Appendix: Detailed Polling Results

In a word, what criteria, other than what you've heard today do you think should be considered when siting PSH?

Response	Number of Responses
Water availability	6
Feasibility	6
Tribal reserved rights	4
Habitat	3
Cultural sites	2
Interconnection	2
Transmission	2
Water	2
Aquifer quality	1
Burdens	1
Capacity	1
Climate change benefits	1
Community engagement	1
Consent	1
Consultation	1
Cost-benefit	1
Cumulative impact	1
Damage averted	1
Demand	1
Duration	1
Ecosystem service valuation	1
Effective	1
EIS	1
Endangered	1
Energy need	1
Engineering constraints	1
Generations	1
Geologic seismic risk	1
Granularity	1
Indigenous rights	1
Life-cycle impacts	1
Needed?	1
Other storage options	1
State listed species	1
Stewardship	1
Sustainable	1

Response	Number of Responses
Trade-offs	1
Transmission interconnection opportunity; community support; "Energy Community" (relates to tax credit)	1
Tribal sovereignty	1
Vadose zone contamination plumes	1
Water resources	1
Waters future value	1

What more would you like to learn in future meetings about PSH?

Response	Net number of upvotes by participants
Project benefits	12
Trade-offs with other energy storage options	11
Tribal input	11
Siting pathways	11
Who benefits and who is impacted	10
Tribal trust responsibilities	8
I would like to see the current timeline for pumped hydro sighting, environmental review, community engagement, financing, construction, and deployment. I would then like to see opportunities identified for making that process quicker, more transparent, and shorter while protecting stakeholders.	7
How many MW of energy storage does WA anticipate needing by 2050?	7
How much is needed in WA? Winter/summer, day/night peak, etc.	7
Tribal engagement	6
WA climate goals and PSH-potential impacts	5
Pending proposals	5
Does more effective storage reduce some pressure to build out more wind to generate electricity at night?	4
How much storage is needed, and how many sites would be required to meet that overall need?	4
Connection to infrastructure	3
Tradeoff for elevation change/reservoir footprint needed	3
Community interest	3
Probable sites Likely to flood steep and inaccessible landscapes which are utilized by wildlife.	2
Projected impacts	2
Construction carbon footprint	2
Will the process be driven by developers like large solar?	2
ETA: I would like to see the current timeline for pumped hydro sighting, environmental review, community engagement,	1

Response	Net number of upvotes by participants
financing, construction, and deployment, and Decommission. I would then like to see opportunities identified for making that process transparent, and shorter while protecting people.	
Closed loop, battery storage	1
For areas of potential project sites, where would that energy serve?	1
Technical siting details	1
Details engineering and siting issues	1
Feasibility of soil composition	'-1

Who else should we talk to?

Response	Net number of upvotes by participants
Local governments	10
Utilities	10
Tribal Governments	9
WA State Association of Counties	8
Land trust and conservation orgs	8
Residents, especially those near potential sites	7
Existing pump storage owners	7
Local climate experts	5
Local communities, CBOs	5
Site developers to understand their requirements	4
Department of ecology nexus to PEIS	4
Pumped Storage developers. Without them, what will change will new projects being evaluated?	3
PSE, Avista, to talk about how storage will reduce costs to consumers.	3
DOE and the National labs	3
Educate legislators!!	3
Are there tribes that have looked at pumped storage as a sustainable way to generate revenue?	2
Transmission entities	2
Low impact hydropower institute	2
Labor unions	1
Universities - since there are few opportunities to access education to think critically and participate in the area of emerging energy technologies	1
Finance for pumped hydro	1
Grand Coulee/Banks Lake run in both directions is essentially the perfect example of this concept.	0