

Virtual Open House Meeting Summary
GreenGen Mokelumne Water Battery Project

July 30, 2020, 4:00 – 5:30 PM

Remote Access Only: Due to ongoing coronavirus concerns and travel restrictions, GreenGen knows that stakeholder health and safety is of the utmost importance and has shifted to virtual engagement. If possible, GreenGen is also planning to hold an in-person open house in the project area during the next six months when the PAD nears completion.

Webinar Video Link: <https://kearnswest.adobeconnect.com/greengen>

Audio Conference Line: 1-866-705-2554, Participant Code: 541575

Welcome and Introductions

Kelsey Rugani, Facilitator, opened the meeting and reviewed the agenda, ground rules, and ways to participate. She noted that several questions that had been submitted in advance will be answered first in the Question & Answer portion of the presentation. She invited attendees to submit additional questions by emailing info@greengenstorage.com or typing questions directly into the chat box.

Jennifer Rouda, GreenGen Storage Management Team, introduced herself and welcomed meeting attendees to the virtual open house. GreenGen is pursuing an opportunity with the Mokelumne Water Battery Project in California to develop a utility-scale, “green energy” project with local socioeconomic benefits. The project will provide renewable energy and energy storage to help California comply with SB 100 and become carbon-free by 2045. She stated that the project team looks forward to having in-person meetings in the future when it is safe to do so. She noted that this is a critical time as the project team prepares to submit the Pre-Application Document (PAD) and thanked all attendees for making the effort to join the virtual meeting today.

Jennifer noted that the GreenGen project team comprises specialists in pumped storage projects, stakeholder engagement, tribal outreach, engineering, and permitting. She thanked everybody for their participation and engagement to date. She introduced the other presenters:

- Scott Flake, Independent Engineering Consultant, former Senior Director Iowa Hill Development at the Sacramento Municipal Utility District.
- Mike Manwaring, Engineering Geologist with McMillen Jacobs Associates.
- David Harper, Tribal Liaison and member of the Colorado River Indian Tribes.

Last, Jennifer reminded attendees that feedback is welcome at any time via the chat box or through email at info@greengenstorage.com and krugani@kearnswest.com.

Debra Grimes, Cultural Resources Specialist and Member of the Calaveras Band of Mi-Wuk Indians, offered a blessing.

Project Introduction and Update

Jennifer provided an overview of the Mokelumne Water Battery Project. The Mokelumne Water Battery Project is located in the Sierra foothills, east of Sacramento and about 33 miles east of the City of Jackson. The project will cycle water between the existing Salt Springs Reservoir and either the Lower

Bear River Reservoir or the Upper Bear River Reservoir. This water will be stored until it is released to generate carbon-free electricity to meet peak energy demand. The final project size will be determined based on the environmental, engineering, and economic analysis. Currently, project configurations under consideration vary in output and potential stored energy. The project size will be between approximately 400 MW and 1,200 MW and store between 3,200 MWh and 9,600 MWh of energy. Currently, a project that can store energy for a minimum of 8 hours would be most useful for the market.

Jennifer described the project location and Federal Energy Regulatory Commission (FERC) preliminary permit process. GreenGen has a preliminary permit to pursue the development of a pumped storage facility between two existing reservoirs on the Mokelumne River in the Sierra Nevadas in Amador and Calaveras Counties. Most of the project area is U.S. Forest Service (USFS) land. Some land along the north edge of the Salt Springs Reservoir abuts the Mokelumne Wilderness Area. She noted that existing reservoirs are currently owned and operated by Pacific Gas & Electric (PG&E) as part of FERC P-137. The permitting and licensing should be completed by 2023, which will be followed by three to four years of construction. In addition to the FERC permitting and licensing process, GreenGen plans to go through the CAISO Transmission Planning process.

Key features of the project include:

- Water conveyance tunnel and penstocks will cycle water between and upper and a lower reservoir.
- Either a subsurface or pit style powerhouse that will contain either a two-unit or three-unit reversible pump-turbine configuration (depending on final capacity).
- An option for transmission currently under consideration is a 17-mile transmission line to Tiger Creek Substation.

Project benefits are expected to include:

- Providing reliable, carbon-free electricity.
- Supporting California's energy and emissions reduction goals for integrating more renewable power.
- Creating up to 40 permanent jobs and over 500 construction jobs.
- Providing local economic stimulus.
- Enhancing the ability for existing projects to meet water delivery, climate resiliency, and fire protection goals.

The project team answered the following questions:

- Question: Does "excess renewable generation" include generation from fossil fuels?
 - Response: "Renewable" energy generation refers to solar or wind energy that will be used to pump water uphill when prices are low (off-peak). When energy resources are needed, this stored water can be released to generate power and meet peak energy demand.
- Question: How many permanent local jobs will this project create?
 - Response: We do not yet know how many jobs will be created. Based on research of other similar projects being developed across the US, it has been estimated that the

project may create around 40 permanent jobs, depending on the size of the project and how the project is staffed and operated.

FERC Updates, Recent Project Developments, and Permitting Needs

Scott provided an update on the project's current status in the FERC permitting process. FERC issued a preliminary permit for the Mokelumne Water Battery Project (Project No. 12796-000) in December 2017. GreenGen provided an update on recent engineering, permitting and regulatory, and stakeholder outreach efforts in a May 15, 2020 report. The GreenGen Storage project team will apply for an extension in October to allow the team to finish all of the work needed for the submission of the FERC License Application.

Scott proceeded to provide an overview of recent project developments and highlighted the following:

- Power-Tech Engineers, Inc. (PTEI) advanced some economic and engineering analyses for the project, evaluated several alignment alternatives between the upper and lower reservoir storage, and developed various storage duration and capacity scenarios.
- McMillen Jacobs Associates is using these analyses to proceed with an engineering design.
- Equipment characteristics were revised based on the refined Project sizing configurations and storage duration alternatives.
- The team conducted a preliminary assessment of options for securing project water rights alternatives. The project team is also finalizing a contract to retain a water rights expert familiar with this region.
- The team developed an updated project schedule, including alternatives for different contracting strategies and potential off-taker partners.
- The team developed a preliminary list of endangered or listed species for the project area.
- The team developed a preliminary list of permits anticipated for the FERC licensing studies and project construction activities. The team will identify a range of studies around key resource areas. Hydrology, water temperature, and water quality are particularly important for this sensitive watershed.
- The team conducted a survey of project lands ownership to incorporate into project maps.
- The team is preparing to draft Pre-Application Document for potential review in October 2020.
- The team is continuing to monitor ongoing activities in this watershed.
- The team is evaluating anticipated environmental, cultural, water quality, and recreational resources associated with project development.

Mike provided an overview of upcoming activities, the current project configuration, and the development schedule. He noted that the project team would like to include as much available data as possible in the PAD submission and is considering ways to receive feedback and comments from stakeholders on the Draft PAD. The formal FERC licensing process will begin after the team submits the PAD. This process includes one to two years of field studies, water temperature modeling, and other studies.

The PAD will include:

- Project design updates based on the results of the ongoing environmental, engineering, and cultural resource assessments of existing information. The project team will conduct a data gap analysis during the licensing phase.
- A preferred project size and study area. The team is focusing on smaller capacities, which will allow for larger storage duration options. PTEI has conducted the Initial Pre-Feasibility Study and McMillen Jacobs Associates is conducting the Preliminary Engineering for the FERC license.
- A conceptual project development schedule.

Mike provided an overview of the current project conceptual layout and highlighted the following key features of the project alternatives:

- The engineering analysis includes developing project alternatives that will raise dams at either Lower Bear River Reservoir or Upper Bear River Reservoir. Dam raises may differ between Lower Bear and Upper Bear because reservoir capacity (acre-feet) at Lower Bear is greater than at Upper Bear.
- There is no proposal to raise the dam at Salt Springs Reservoir. However, all operations scenarios include daily fluctuations with each storage cycle at Salt Springs Reservoir, which is a culturally sensitive area.
- Longer storage duration options can be achieved with smaller project sizes and generation capacities.
- A “no dam raise” scenario would have less impact on existing facilities, but will have different engineering and water rights challenges.

The project team addressed the following questions and comments:

- Question: How will this project impact lower reaches of the Mokelumne River where there is now a Wild and Scenic River designation?
 - Response: Project operations will be restricted to avoid impacts (i.e. water temperature and flows) to the river within and downstream of the Wild and Scenic designation. Detailed operational models will be developed to determine how the project can be developed within this criterion.
- Question: How will this project impact downstream water supply?
 - Response: GreenGen Storage is committed to protecting the agreements developed under the existing FERC licenses and settlement agreements on the Mokelumne River; therefore no changes to the downstream water supply are expected.
- Question: Who will perform the water temperature modeling studies?
 - Response: GreenGen has not yet selected an environmental contractor for water temperature modeling. The project team is open to input from all stakeholders on the factors that should be incorporated into the study.
- Question: How will GreenGen engage stakeholders and when will draft documents be provided for review?
 - Response: From now until the fall, the project team is focused on collecting studies or data on the natural environment to submit with the PAD to FERC. The project team welcomes continued discussions with stakeholders on relevant studies and impacts.
- Question: Did this project require a subsidy to break even? How many years until payback?

- Response: No. It requires a power purchase agreement that values the project for services provided. This can be a challenge for projects being developed in today’s energy market.
- Question: What time of year will pumping occur?
 - Response: Pumping (filling the upper reservoir) will be determined based on the need for capacity, environmental permits, and power economics. Typical pumped storage projects will pump one to two times daily and in most weeks of the year.
- Comment: Potential impacts on the Sierra Nevada yellow-legged frog should be considered.
 - Response: GreenGen will follow Endangered Species Act requirements for evaluating threatened and endangered species in the area. The Sierra Nevada yellow-legged frog is on our preliminary list of species. We have not yet hired a biologist to screen for critical habitats.
- Question: How big could a “no dam raise” project be?
 - Response: The “no dam raise” scenario would likely result in a smaller project than what the current preliminary permit envisions, but this may ultimately be a preferable alternative. This scenario is not on the table of alternative configurations (shown on the slide) because it has only been part of our preliminary analysis. One of our major operational constraints is access to water rights.
- Question: Why does GreenGen think a pumped storage project will be successful now when others have not successfully completed their projects? What is different about the energy market today?
 - Response: GreenGen believes the time is right for pumped storage. The markets have evolved over the last ten to fifteen years and renewable energy is being added to the grid at a rate that has not been seen before in California. The State has also set a target for 100 percent carbon-free electricity by 2045. Long duration storage solutions will be critical in achieving this goal for a green energy future.
- Question: What is PG&E’s role in the development of this project?
 - Response: PG&E is one of the many stakeholders in the project and owner of project P-137. Their current role has not been determined, but GreenGen Storage will be coordinating with PG&E throughout project development.
- Question: How will cultural resource issues be addressed in the review and how will tribal outreach be conducted?
 - Response: Cultural resources will be evaluated during the environmental review process, under both CEQA and NEPA. Furthermore, the project team will continue to reach out to tribes in the area to ensure awareness of the project, obtain feedback about sensitive cultural resources, and discuss issues and concerns. The project team is committed to collaborating with tribes and recognizes tribal sovereignty and self-governance.
- Question: Has GreenGen reached out to the Eldorado National Forest to gather information for the PAD and study needs?
 - Response: The GreenGen project team has met with USFS. USFS requested an additional meeting at a later time (after this Virtual Open House) to discuss the PAD and study needs.
- Question: During which months are you planning to operate the project?

- Response: In California, solar and wind are in abundance every month of the year. We expect to operate the project in most or all months.
- Question: How do you know that you are using renewable energy to pump water versus fossil generation?
 - Response: This depends on the market at the time of pumping. We can be reasonably assured that when we are getting paid to pump water (negative power prices), electricity is being generated from solar resources because other sources are not likely to choose to generate when prices are negative. Plus, by 2045 when the State plan to have 100% carbon-free electricity, all pumping power should be from clean, emission free resources.
- Question: How will GreenGen mitigate impacts to recreation at Lower Bear?
 - Response: GreenGen is aware that Lower Bear is a popular recreational area. Recreation is one of the many key resource areas that will be evaluated through both the CEQA and NEPA processes. We welcome feedback on how these resources are used. Our goal is to first avoid impacts and then minimize impacts wherever possible.
- Question: Is this project going to involve solar panels or wind turbines?
 - Response: The current project design does not include a solar or wind component. Partnerships with solar or wind projects may be practical for project economics but the focus of our project is the water battery.
- Question: How will the project handle tunnel spoils?
 - Response: The project team will need to conduct a study to determine what will happen with the tunnel spoils. The volume of rock will depend on potential uses and quality, construction methodology and cost, and potential impacts to roadways.
- Question: Wouldn't the multiple home battery storage units be cheaper and have fewer environmental impacts than a pumped storage battery project?
 - Response: Home batteries and water batteries are both needed and have different applications. Home batteries can provide 15 minutes to an hour of storage. Pumped storage can provide long duration storage and provide much more energy.
- Question: How is mitigation going to work for archaeological sites?
 - Response: GreenGen wants to meet with each tribe to hear their recommendations for the project. Tribes designate their sacred and spiritual sites and we will collaborate with them to work toward positive outcomes.
- Question: Who will address water rights issues?
 - Response: Water rights are very important to this project and we will do our due diligence and retain a water rights attorney to assist us. This water battery project will cycle water between reservoirs — a non-consumptive water use.
- Question: What is the plan for decommissioning the water battery project?
 - Response: Decommissioning will be part of the project economics and is a required topic that will be addressed in the environmental document.

Update on Stakeholder Outreach

Kelsey provided an overview of stakeholder outreach activities to date. The GreenGen Storage team is committed to a strong outreach process, which began in late 2018. The project team welcomes the opportunity to continue meeting with stakeholders to continue any discussions regarding the project.

Dave shared the project team’s commitment to environmental stewardship. Project development will be guided by this commitment to protecting existing environmental and resource use where possible, and mitigating project impacts where appropriate. GreenGen pledges to work closely with state and federal agencies, tribes, and local stakeholders to honor this commitment. He noted that the project team intends to continue building a transparent relationship with tribes, meeting with them to discuss their land base, sacred areas, and collaborating on their mitigation efforts.

The project team addressed the following questions and comments:

- Question: Will the project team address climate change in the water temperature studies?
 - Response: Climate change adaptation is a required component of the environmental evaluation. We will have to evaluate whether our project will impact the ability of existing facilities to comply with their water temperature requirements.
- Question: Will this project be able to replace the gas turbines ramping services?
 - Response: Yes. The Mokelumne Water Battery Project can ramp quickly and efficiently to use renewable energy to meet the demand load that CAISO is currently meeting using traditional gas and combustion turbines.
- Question: What licensing process are you planning to follow, the Integrated Licensing Process (ILP) or the Traditional Licensing Process (TLP)?
 - Response: The current default is the ILP. If we need more time for stakeholder input, then we may consider the TLP. We will likely make a decision about whether we will need to petition for the TLP after the PAD submission.
- Comment: “Mitigating “where possible” and “where appropriate” is very discomfiting language.
 - Response: The GreenGen team is committed to environmental stewardship and stakeholder engagement to understand needs, interests, and potential conflicts. The team has been conducting public engagement earlier than required by CEQA/NEPA in order to understand the region and craft a project that truly minimizes impacts and creates local benefits.

Next Steps

- GreenGen is planning to hold an in-person or virtual open house during the next six months when the PAD nears completion.
- If you wish to make a comment or request a meeting, please email Jen@greengenstorage.com.