

June 16, 2021

Shasta County Department of Resource Management
Attn: Paul Hellman, Director
300 Park Marina Circle
1855 Placer Street, Suite 103
Redding, California 96001

Re: Fountain Wind Project to Improve Local Grid Reliability

Dear Mr. Hellman,

I have reviewed the June 6 comments submitted by Ms. Osa which include questions about thermal overloads and provide the following to the Shasta County Department of Resource Management to help clarify the interconnection of the Fountain Wind Project (“Project”). As described below, the **Fountain Wind Project will improve local grid reliability – not worsen it**. The interconnection is designed to prevent thermal overloads and has automatic controls that maintain the Project’s required voltage schedule at its point of interconnection and to ensure it does not exceed its interconnection capacity limit.

Federal Reliability Standards and Compliance

All generation, including Fountain Wind, must comply with federal requirements and regional reliability authorities before interconnecting to the bulk power system. Regulations regarding grid reliability and interconnection ensure all generation projects are connected in a safe and reliable fashion without creating stability or reliability problems.

The Energy Policy Act of 2005 requires that the Federal Energy Reliability Commission (“FERC”) approve and enforce standards to protect and improve the reliability of the nation’s bulk power system. The North American Electric Reliability Corporation (“NERC”) develops, revises and implements standards under this statutory framework and delegates compliance monitoring and enforcement authority to various regional entities, such as the Western Electricity Coordinating Council (“WECC”). WECC develops and implements Regional Reliability Standards and WECC Regional Criteria for the Western Interconnection. Regional entities establish rules that are applicable to that region using subject matter experts who know the physical or operational differences of the local high-voltage grid. NERC also develops and approves regional reliability standards, which are more stringent than a continent-wide reliability standard and may address a regional difference in the bulk power system.

As required by the Federal Power Act of 1935, the California Independent System Operator (“CAISO”) operates under the terms and conditions of its FERC approved tariff, which contains the rates, terms

and conditions governing all areas of the ISO's business, including generation interconnection and transmission planning.

Together, these entities ensure the bulk power system remains reliable and stable. They also ensure the Fountain Wind Project will not create reliability issues for the grid. In fact, as described below, **Fountain Wind will add to local grid reliability.**

Interconnection Overview

The Project will connect to PG&E's transmission system on an existing 230 kV transmission line that connects the Pit #1 Dam to the Cottonwood Substation via a new interconnection switching station ("SS"). The Project has completed all necessary interconnection studies and has an executed its Large Generator Interconnection Agreement ("LGIA") with CAISO and PG&E. The project does not connect to lines leading into the Round Mountain substation.

Interconnection Study Process & Upgrades

The Project has completed all necessary studies pursuant to requirements set forth by the CAISO, the entity that maintains grid reliability and establishes the interconnection study practices that all generation projects are required to follow. The Project submitted its LGIA Request in the CAISO's Study Cluster 8 in April 2015 and was studied for interconnection service and full capacity deliverability status ("FCDS"), in other words, the ability to deliver the full output of the Project to the grid.

For the Project to obtain FCDS, CAISO identified two required transmission system upgrades: 1) the implementation of a Special Protection Scheme ("SPS") that will automatically disconnect Fountain Wind from the transmission grid in the event of overloads on the Cottonwood to Fountain Wind SS line segment. This will be an expansion of the existing SPS that is currently deployed at the Hatchet Ridge wind project which is connecting at the Carberry SS, located on the Round Mountain to Pit #3 230kV transmission line , and 2) the upgrade of two 230kV circuit breakers at the Cottonwood substation. Furthermore, as the Reliability Coordinator, CAISO has the authority to require the Project reduce its output or disconnect from the grid completely to maintain system reliability.

In 2019, CAISO reassessed the upgrades required for Fountain Wind to maintain FCDS and identified the same two upgrades as originally identified (described above). These upgrades will be implemented prior to the Fountain Wind Project becoming operational.

Project Controls

The Project will have a power plant controller (“PPC”) that regulates and controls the wind turbine generators and automatically responds to CAISO and/or PG&E operating instructions. The PPC also ensures that the Fountain Wind project maintains its required voltage schedule at its point of interconnection and does not exceed its interconnection capacity limit.

Flow of Electricity

Most of the energy from the Project will flow to the 230kV bus at the Cottonwood substation, south of Round Mountain. There are three existing 230kV lines that connect the Round Mountain substation to the Cottonwood substation, however the flow on the 230kV lines between the two substations flow in a north to south direction and are heavily impacted by the flows on the California-Oregon Intertie (COI). Because the energy from the Project is injected south of Round Mountain, predominately at Cottonwood, it does not have a material impact on flows between Round Mountain and Cottonwood.

Grid Stability Upgrades at Round Mountain

The Round Mountain 500kV Dynamic Reactive Support project, described in the 2018-2019 CAISO Transmission Plan, is driven by both high and low voltage reliability concerns at the Round Mountain 500kV substation. Under non-peak conditions when the COI energy flows are low, the lightly loaded 500kV transmission lines into and out of Round Mountain are essentially a reactive power source that drives the terminal voltage at Round Mountain to higher-than-normal levels. Similarly, when these 500kV transmissions are heavily loaded, they are a reactive power sink that drives the terminal voltage at Round Mountain down to lower-than-normal levels. To address the voltage reliability concerns, CAISO identified the need for a reactive power device that can absorb and produce approximately 500 MVARs of reactive power. The project to add this reactive power capability was subsequently approved by CAISO and is scheduled to be in-service by June 1, 2024.

The Project’s wind turbine generators will have the ability to absorb and produce reactive power as well and the Project’s PPC will automatically respond to CAISO and/or PG&E operating instructions. The PPC will also automatically respond to the voltage at its point of interconnection and absorb or produce reactive power depending on the transmission system’s voltage profile. This automatic response to voltage levels will benefit local grid reliability.

As described, the Project will fund required upgrades on PG&E’s system prior to commercial operations to ensure transmission system reliability is maintained. The wind turbine generators maintain reactive power capability even at low wind conditions with no active power production. This reactive power capability allows the Project to maintain the required voltage at its point of interconnection at all times, providing reliability benefits to the transmission system as well.

Please feel free to contact me if there are any further questions about how Fountain Wind will improve local grid reliability.

Sincerely,

Mark Lawlor

Mark Lawlor
Vice President
ConnectGen