

Rocky Forge Wind, LLC

Botetourt County, Virginia

Operations and Maintenance Plan: Rocky Forge Wind, LLC

Prepared by:
Rocky Forge Wind, LLC

By: Apex GCL, LLC
Its: Sole Member

By: Apex Clean Energy Holdings, LLC
Its: Sole Member

Operations and Maintenance

Rocky Forge Wind will be operated and maintained by a team of approximately 6-8 personnel, including facility managers, a site manager, and a certified crew of technicians located in the local community of the project. This team will be located at the project site or operations and maintenance (O&M) building during normal business hours performing routine checks, responding to issues including those relating to fauna and the mitigation plan, and optimizing the performance of the wind farm. The team will have specified personnel on call 24 hours per day as well, should an issue arise outside of normal business hours. The mitigation plan is incorporated into and made a part of this Operations and Maintenance Plan.

Rocky Forge Wind will be built with many safety and control mechanisms in place. These mechanisms are generally monitored using a Supervisory Control and Data Acquisition system (SCADA). SCADA allows for each turbine, which is connected via underground fiber optic cable, to be monitored real-time by the O&M staff. Rocky Forge Wind will also be built in a way that is capable to be remotely monitored, thus increasing the personnel managing the project operations, as well as the performance and reliability of the turbines. Wind projects are designed this way to have repetitive forms of control. Not only will the local O&M office have full control of the wind turbines, but a 24/7 remote operations facility will also have control of the individual turbines. These two teams coordinate to ensure the wind turbines operate safely and efficiently. A third mechanism for safety and control are the turbines themselves. Each turbine monitors the wind speed and direction itself to ensure its current position is most efficient to produce electricity. This data is also used for feathering the blades and applying the brakes in high wind speeds, as well as to tell the turbine when the wind is strong enough to begin turning the generator and producing electricity at the “cut-in” wind speed.

The wind turbines that are chosen for installation at Rocky Forge will be from a trusted, leading manufacturer of IEC Certified wind turbines. These manufacturers ensure that the turbines meet the standards of the industry to prevent major malfunctions. Modern wind turbine technology has allowed for the wind turbines to become very reliable. Industry standard for availability of turbines to produce electricity during operations is approximately 97 percent.

During operations, the O&M staff will perform scheduled, preventative maintenance on the turbines. This is typically done in conjunction with representatives from the manufacturer for the first 1-3 years to ensure that maintenance protocol for the specific turbine installed is completely understood by the O&M staff.

In accordance with industry standards, Rocky Forge Wind may use herbicides throughout the life of the project to control weeds and other plant growth around the associated facilities on the project, as well as electrical infrastructure for safety. Areas with underground cabling will be allowed to grow with native plant species, but trees will

be controlled to eliminate deep rooting issues with the infrastructure. These native plants will help eliminate erosion, and will be controlled with mowing and environmentally friendly herbicide sprays as practicable, to avoid greater impact to the environment. Areas around facilities are typically sprayed once per year, on average. Typical practice is to use a licensed contractor for this work to ensure regulatory compliance and proper procedure.

The final O&M building location will house offices and associated equipment for the staff including, but not limited to, computers, printers, phones, and office supplies. Typically, there will be a garage for spare components, parts, and tools needed for maintaining the wind farm. Larger, more specialized components will be ordered specifically for replacement on turbines if needed. This building will also include parking for maintenance vehicles and cars.

Other facilities that will be operated, maintained, and inspected by Rocky Forge Wind include the onsite collection and substation system. The wind turbines will be connected to the Facility's 34.5 kV collector system, which will aggregate the energy from the turbines to a collector substation. The collector substation of the Facility will include a 230kV step-up transformer, a 230kV circuit breaker bay complete with circuit breaker, a switching substation owned by the interconnecting utility, a 230kV dead-end for connection to the adjacent switching station and transmission system, 34.5kV circuit breakers for each collector system circuit along with isolating disconnect switches, bus, steel, insulators, foundations, and a control building with electronic control devices for protection and control. A radial 230kV line of approximately 200 feet will connect the Facility with the transmission system owned by Virginia Electric Power Co. transmission facilities.

During the development of a wind farm, there are specific studies that are performed to ensure that the structures on site do not interfere with federally-licensed (FCC) facilities for local radio, TV signals, point-to-point beam path signals, land mobile, and public safety signals.

The results of the study find that there are no FCC land mobile transmitting stations, radio broadcast facilities, or microwave paths that are expected to be adversely affected. According to the studies, "Over-the-air TV interference due to operating wind turbines may occur, but effective mitigation methods to resolve the interference are available, with satellite or cable service installation providing the worst-case solution. No radio broadcast facilities are likely to be affected." Should a situation arise where there is a citizen with interference problems due to the wind facility, Rocky Forge Wind will work with them on an individual basis to mitigate and cure the problem.