



## **POWERSECURE**

### **BUTLER FARMS MICROGRID**

Electric distribution cooperative South River Electric Membership Corporation, South River EMC for short, and its power supplier, North Carolina's Electric Cooperatives formed a partnership with Butler Farms, a sustainability-focused hog farm in Lillington, North Carolina, to develop a microgrid. They selected PowerSecure as the project's engineering, procurement, and construction contractor to collaborate on the design and commissioning of the project.

The project improves the reliability of the electric system and farm operations by avoiding prolonged outages after interruptions to grid power, PowerSecure said. During normal conditions, the microgrid will connect to South River EMC's distribution system to integrate local renewable resources, and supplement and diversify traditional power resources. During outages, it can operate in island mode to power Butler Farms and nearby homes. This project also serves as a case study for how agriculture and electric utilities, two important industries in North Carolina, can work together to promote sustainability and improve quality-of-life.

In 2008, to lessen the farm's GHG emission and ammonia effects on neighbors and environment, Butler Farms installed covers over their four-acre lagoon area, PowerSecure explained. These lagoon covers capture anaerobically produced methane – biogas – to use as power generation fuel rather than allowing the GHG to go directly into the atmosphere.

The farm also installed a 20-KW solar panel array and has a 100-KW standby diesel generator that can supply a full system backup. In 2017, Butler Farms combined its existing biogas and power generation systems into a new microgrid in partnership with South River EMC and North Carolina's Electric Cooperatives. PowerSecure installed a 250-KW/735-kWh battery storage system and microgrid controller to coordinate the components. This microgrid integrates local renewable energy resources, including solar and biogas, with energy storage.

The microgrid uses local low-carbon generator resources to provide grid flexibility and defers operation of the diesel generator during outages,

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### WHAT THE JUDGES SAID...



A fantastic example of how to grow an initiative to benefit the larger community. This kind of visionary community integration is key to escalating the clean energy conversion.”

PowerSecure said. The microgrid controller allows South River EMC and North Carolina's Electric Cooperatives to initiate the microgrid and automatically isolate the farm from the larger electric distribution system. There are three reclosers: one that isolates the farm from the cooperative, and two on the utility line to isolate the surrounding area between the reclosers from the utility. The cooperative can dispatch the system during peak energy usage while connected to the grid to explore potential benefits of microgrids for demand response.

The project enabled a research partnership with North Carolina State University to analyze the relationship between battery life and its dispatch strategy. This research should help inform decisions on the deployment of future cooperative energy storage systems, according to PowerSecure. It is also part of a STEM learning initiative for elementary students. PowerSecure said that Butler Farms focuses on sustainability and supporting its local community, and this project contributes environmental benefits and enhanced power reliability for their neighbors. 🌱

