

CASE STUDY

Stone Edge Farm's Microgrid: Providing Power During the 2017 California Wildfire Power Outages

A CUSTOMER SUCCESS STORY



Project Overview

System Owner 	Stone Edge Farm
Location 	Sonoma, California
Components 	Various [See below]

Due to the flexibility and ease of scalability provided by the modular EDGE® control platform, the Stone Edge Farms microgrid is a continuously evolving system.

Use this QR code to stay up to date on the most current components in this state-of-art microgrid.



Read the extended white paper case study on Stone Edge Farm and the origin of the decentralized microgrid controller.



Introduction

The 2017 wildfires that ravaged California posed significant challenges to the energy infrastructure, causing widespread power outages that disrupted daily life and threatened critical services. Stone Edge Farm, a 16-acre winery and organic farm in Sonoma County, stood as a shining example of energy resilience during this crisis. Stone Edge Farm's microgrid system demonstrated its ability to provide an uninterrupted power supply, ensuring not only the farm's operations and safety but also highlighting the critical role of distributed energy resources (DERs) and microgrids in mitigating threats to the grid caused by the rise of extreme weather events.

Background

Stone Edge Farm is renowned for its commitment to sustainable farming practices. Additionally, the owner understood the increasing frequency of extreme weather-induced power outages and needed a solution to overcome this risk.

To achieve energy independence and strengthen resilience, the owner started installing solar panels, battery storage, and generators, building what would become a microgrid. Coupled with its innovative decentralized control system, the microgrid enables the farm to generate, store, and distribute clean and reliable electricity while remaining grid-connected or islanding and disconnected from the grid.

The 2017 Wildfires

In October 2017, a downed power line sparked a series of wildfires in California, which eventually burned over 161,000 acres across Sonoma and Napa Counties and damaged or wholly destroyed around 8,200 structures.¹ As the wildfires raged, utility companies triggered precautionary power shutdowns to prevent additional fire risks and turned off the central grid to protect communities.

Stone Edge Farm faced the challenge of maintaining essential operations, including irrigation, refrigeration, and critical infrastructure support.



Microgrid Delivers *Resilience*

Despite increasing smoke and ash, Stone Edge Farm's microgrid showcased its resilience and ability to smoothly sustain operations independently for ten days during the power outages, all while monitoring from afar by cell phone.

The key factors contributing to the microgrid's success were:

Solar Photovoltaic (PV) Generation

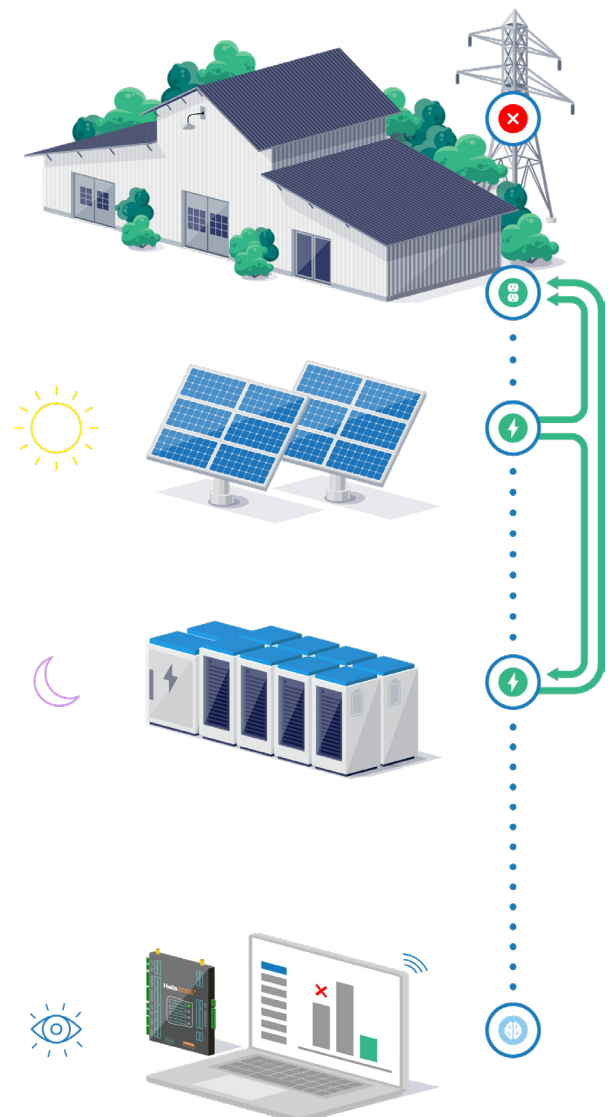
The farm's extensive solar panel array continued to harness sunlight, generating clean electricity throughout the day. The PV system enabled ongoing power supply to the farm's operations, reducing dependency on the grid.

Battery Storage

The microgrid incorporates a robust battery storage system that collects excess solar energy during the day. This stored energy was utilized during the night and periods of low solar generation, ensuring a consistent power supply even when the grid was down.

Advanced Controls and Monitoring

Stone Edge Farm's microgrid employs a sophisticated decentralized control system that optimizes energy usage and efficiently manages the farm's energy requirements. These controls monitored the state of the grid, and when the utility disrupted power, the microgrid automatically disconnected — a process called islanding mode — for a seamless transition to self-sufficient energy generation.



¹"Map of the Month," Association of Bay Area Governments. <https://abag.ca.gov/tools-resources/maps/map-month/2017-north-bay-wildfire-affected-areas> (Accessed July 7, 2023)

Lessons Learned and *Future* Considerations

The success of Stone Edge Farm's microgrid during the 2017 wildfires underscores the invaluable importance of energy resilience in disaster-prone areas.

The following lessons emerged from this case study:



Integrated Microgrid Planning

Careful consideration of system components, load requirements, and the control system is crucial to ensure seamless operation during grid outages.



Continuous System Monitoring and Maintenance

Regular monitoring, testing, and maintenance of microgrid components are essential to ensure optimal performance and reliability.



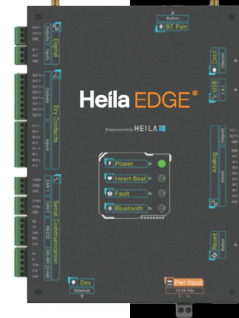
Collaboration with Utility Companies

Establishing collaborative relationships with utility providers enhances mutual benefits during emergencies, enabling resource sharing and optimizing grid connectivity.



Community Engagement

By extending support to the local community during crises, microgrid owners can foster goodwill and strengthen community resilience.



Heila **EDGE**®

- Dynamic
- Self-Healing
- Fully Scalable
- Responsive
- Decentralized Microgrid Control

The Origin of Heila **EDGE**®

Heila Technologies developed the Heila **EDGE**® — a modular, flexible, and decentralized microgrid control and optimization platform — as a result of working to optimize the control system for Stone Edge Farm's microgrid DER assets.

Now, Heila **EDGE**® delivers simplified and standardized connection and optimization of DERs. It does this by converting DERs into intelligent, interacting agents so owners and operators can build self-managing microgrids and fleets from the ground up and quickly scale them as needs evolve. For businesses, this means peace of mind with simple deployments, durable systems, predictable performances, and enhanced returns on investment.

Customer Success

Stone Edge Farm's microgrid system proved its worth during the 2017 wildfire power outages by providing reliable and resilient clean energy to sustain critical operations. By leveraging solar energy, battery storage, and an innovative decentralized control system, the farm exemplified energy resiliency, benefiting not only its own operations but also the community at large.

As the threat of weather-induced power outages grows more urgent, Stone Edge Farm demonstrates the significance of microgrid control and optimization technology in ensuring energy independence and resilience.

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