

Heila Edge[®]

How the Heila EDGE Control Platform Kept the Lights on During Hurricane Ian

Emera BlockEnergy Customer Success Story

Overview

Customer | Emera Technologies BlockEnergy

ISO | Tampa Electric Company (TECO)

End User | 37 residential homes

Rooftop Solar PV System Sizes | Between 4-10 kW (depending on size of the rooftop)

Home Battery Storage: 17.5 kWh per home

Central Battery Storage (Community Asset) | 240 kWh total

Backup Kohler Generator Capacity | 400 kW total

Location | Southshore Bay, Florida

Commissioning Date | May 2022

Highlights

- 37 homes equipped with fully integrated, shared rooftop solar PV systems
- Multi-site aggregated residential microgrid system
- Behind-the-meter deployment

Key Drivers



Increased Operability



Security



Grid Resilience

Site Background

Southshore Bay, Florida, is a residential community consisting of 37 newly developed houses, each built with distributed energy resources (solar panels, batteries, and smart control devices) that work together across the buildings.

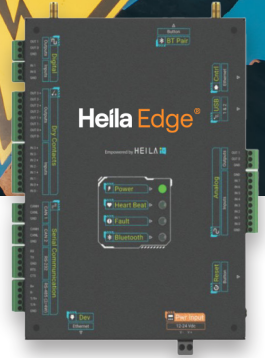
Some Complicated Challenges

Both the frequency and intensity of extreme weather events continue to increase yearly. These devastating forces of nature wreak havoc on the grid, causing widespread power outages, loss of commercial revenue, and expensive damage.

With a focus on developing new ways to deliver renewable energy to customers, Emera Technologies knew that distributed energy resources (DERs) and microgrids offered a promising solution to strengthen grid resilience in the face of these extreme weather events. But since no two DERs systems are alike, the differences in system designs created a roadblock for Emera to offer a microgrid solution for utilities to integrate DERs systems in a reliable or standardized way.

At the same time, electricity customers want to adopt renewable energy for home usage but also face challenges. Too often, monetary and permitting constraints make it difficult to install solar panels and battery storage systems.

Without a way to standardize microgrid deployment, utilities could not strengthen resilience against extreme weather or reliably offer renewable resources to their customers. That is until Heila Technologies introduced the decentralized and modular Heila EDGE microgrid control platform.



An Innovative Solution

To solve the utility's challenges, Emera Technologies partnered with Heila Technologies to deploy the BlockEnergy microgrid platform. This pilot program, located in Southshore Bay, Florida, is the first utility-owned residential microgrid system.

A Plug-and-Play Solution

Wholly owned and operated by TECO, the "plug-and-play" BlockEnergy™ solar-plus-energy storage microgrid enables increased operability, security, and grid resilience to mitigate extreme weather and other events impacting electric utility grid uptime.

Each house connected to the microgrid has a rooftop solar PV system that independently delivers renewable energy to homeowners. The solar arrays connect to a ground-level BlockBox™ that contains a Heila EDGE control node, an energy storage battery, and an inverter that converts the microgrid's direct current (DC) power to alternating current (AC) for residents to use. The BlockBox™ connects to the neighborhood distribution network, where it communicates and shares energy as needed within the community.

A central energy park near the entrance of Southshore Bay houses auxiliary batteries, optional additional generation for outages, and the point of connection to the rest of TECO's power grid. Using the smart, distributed Heila EDGE controls, the system creates a "block loop" of energy while seamlessly integrating with the local utility grid.

The Heila EDGE makes this system possible. The EDGE's innovative decentralized framework means that each asset in the microgrid, in this case, each rooftop PV system, operates as an individual brain that speaks to the system as a whole. This emergent technology can then re-synchronize in planned and unplanned cases, using one or more assets, such as batteries, as the grid-forming agents.

The Heila EDGE platform efficiently controls and optimizes the microgrid. Each node will forecast local load and generation based on historical trends and external inputs to maintain the least amount of low grid-imported energy possible.



Photo Credit: Emera Technologies



Renewable Energy Home

Each home, equipped with a solar PV system, connects to a ground-level BlockBox that contains a Heila EDGE control node, an energy storage battery, and an inverter.



BlockBox™

The BlockBox™ connects to a neighborhood distribution network where it communicates and shares energy as needed within the community.



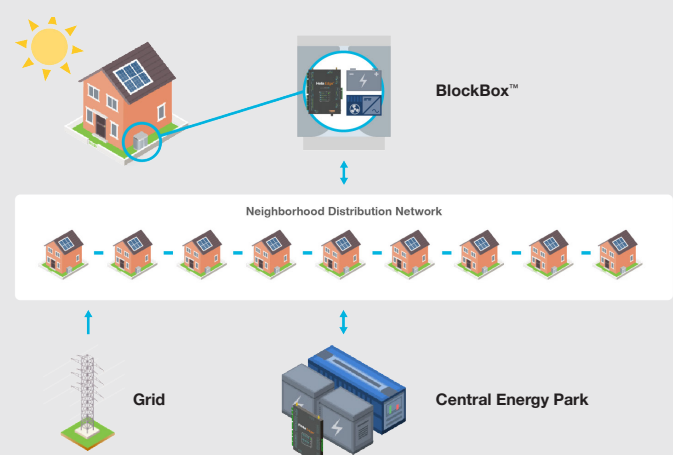
Heila EDGE

The EDGE's innovative decentralized framework allows each asset in the microgrid to operate as an individual brain that speaks to the system as a whole.



Central Energy Park

Near the entrance of Southshore Bay houses are more Heila EDGE devices, auxiliary batteries, optional additional generation for outages, and the point of connection to the rest of TECO's power grid.



The *Promising* End Result

The Southshore Bay BlockEnergy microgrid proved its mettle during 2022's Hurricane Ian, which struck down in the Tampa Bay, Florida, area. The category-4 hurricane knocked out power for more than half a million Tampa Bay-area residents connected to the traditional grid.¹

The Southshore Bay BlockEnergy microgrid, however, maintained power throughout the devastating storm. The microgrid operators prepared for Hurricane Ian by charging the energy storage batteries ahead of time as a power reserve.

Before the hurricane landed, the entire microgrid disconnected, or "islanded" itself, from the grid. Islanding allows the assets in the microgrid to continue interacting with one another to supply power to the homes when the utility's grid goes down.

Strength in Resilience

The microgrid network strengthens resilience and provides grid-wide benefits with frequency support, power export, and power import when a utility wants to store energy.

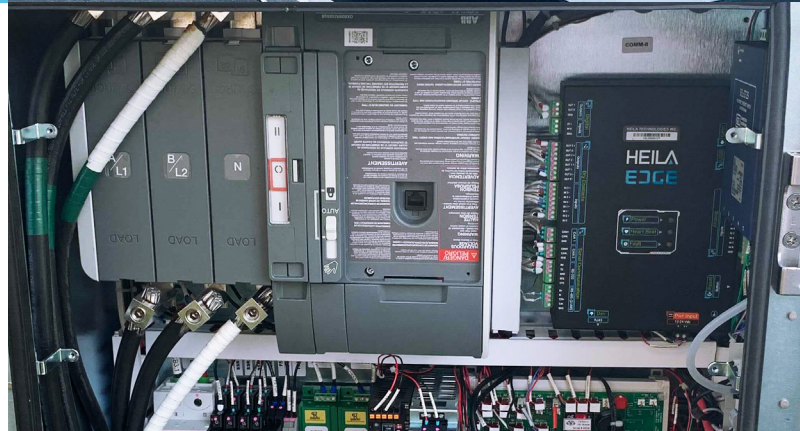
Not only does BlockEnergy mitigate the risks to the electric utility grid uptime posed by extreme weather events, but the first-of-its-kind residential microgrid also provides TECO with a cost-effective way to deliver distributed clean energy resources to its Southshore Bay customers and accelerate its net-zero carbon goals.

Homeowners pay for electricity at the regular metered rate that other TECO customers pay, with no extra grid charges or additional fees. By being part of the BlockEnergy network, up to 80 percent of their home energy comes from the sun without having to hire a solar contractor to install a rooftop PV system, go through the permitting and interconnection process, or have to personally operate or maintain the system at all.

As customers increasingly look to adopt more renewables and have additional choices and control over their energy sources, BlockEnergy with Heila EDGE means utilities can provide customers with what they seek from a power provider.

Additionally, Heila EDGE's modular design enables simplified deployment and rapid scalability to adapt quickly to changing requirements and growing communities. These benefits allow a utility to defer more significant infrastructure investments that may accompany growing levels of financial risk during the energy sector's current decarbonization transition.

¹Sullivan, Dan, *Tampa Bay Times*, "Power outages pass a half-million in Tampa Bay area from Hurricane Ian." Accessed: 11/13/22. <https://www.tampabay.com/hurricane/2022/09/28/power-outages-reported-tampa-bay-area-hurricane-ian-arrives/>



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