

Energy Resiliency During Tropical Storm Isaias

How Microgrids Operate During an Extended Outage



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When Tropical Storm Isaias crippled the Northeast with power outages, Unison Energy's microgrids kept our clients in NY and NJ operating in island mode, independent of the utility.

When Tropical Storm Isaias roared through the Northeast it left over 3.7 million people without power. Thousands of businesses were forced to close, with some remaining closed days later, exasperating the financial blows of the COVID-19 crisis.

A week later, hundreds of thousands remained without power across New York, New Jersey, Connecticut, and nearby states. After Hurricanes Sandy and Irene, Tropical Storm Isaias stands as yet another stark reminder that an increasing number of extreme weather events, coupled with an aging utility grid, means prolonged power outages are the "new normal."

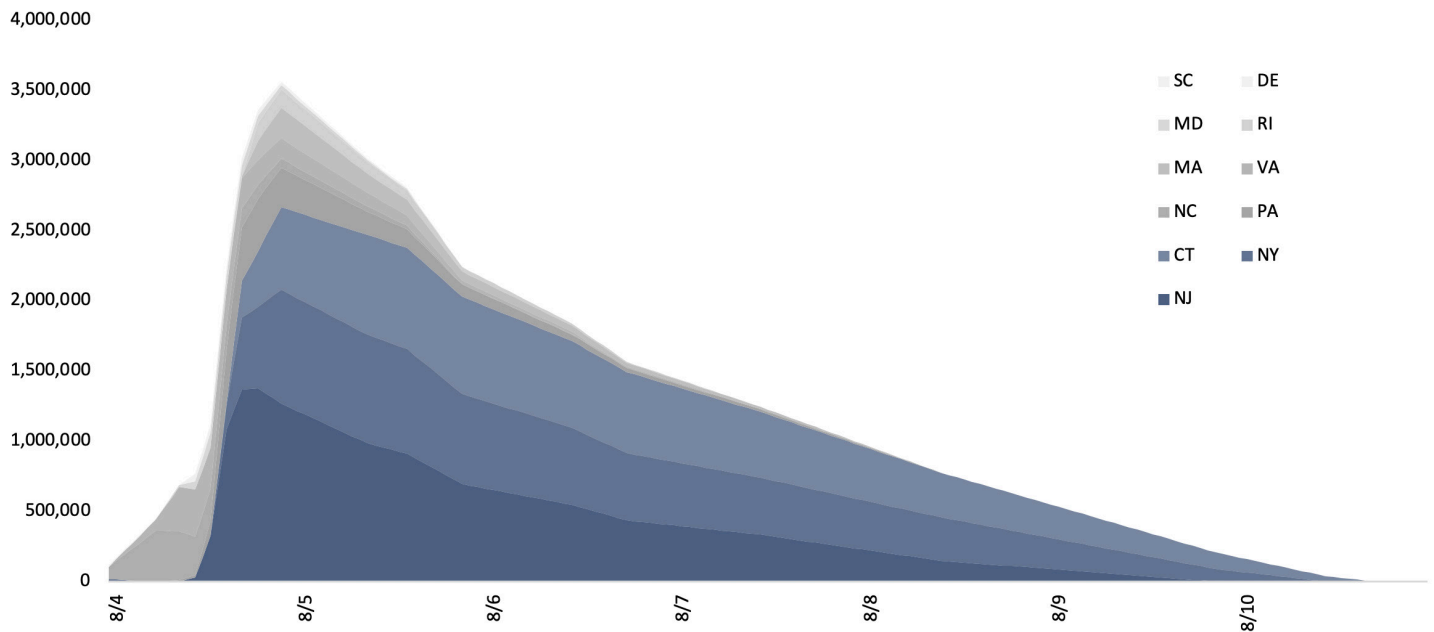
Microgrids Are Designed to Operate in a Utility Outage

As the storm rolled up the East Coast, the Unison Energy operations team was prepared. With a fleet of microgrids lying directly in the path of the storm in Maryland, New Jersey, and New York, Unison Energy's Operations Team Leads Jeremy Sanchez and Joshua Azille implemented Emergency Protocol and dispatched our field service team to be close to the sites.

Unison Energy builds, owns, and operates microgrids for large-scale energy users. A microgrid consists of two critical components — on-site generation that can operate indefinitely, independent of the grid, and a controller that tracks grid stability and opens a breaker to isolate the microgrid from the utility feeder during a grid outage. Microgrids are designed to provide resilient power during large storms like Isaias.

Tropical Storm Isaia

Total Customers Without Power, August 4-10



Storm Preparation Supports

Resiliency During Catastrophic Events

Monday, August 3, as the storm approaches, the Unison Energy operations team books hotel rooms within 10 minutes of each site, while our 24/7 monitoring center sets up double watch. As the winds pick up, technicians review spare parts inventories for each site and transfer extra parts from nearby storage lockers. On site, technicians perform complete site walks, strap down potential flying objects, and top off fluids.

As the Storm Arrives, the Operations Team Shifts into Gear

On **Tuesday, August 4**, winds of over 70 MPH start taking down power lines. A tornado touches down just 70 miles east of **ShopRite Hainesport**.

10:26 AM: At **ShopRite Hainesport**, the microgrid controller automatically detects the utility outage, opens the breaker, and shifts the load to the natural gas engines on site, which surge to pick up 100% of the load. PowerIQ, Unison Energy's monitoring application, used both internally and provided to

clients, automatically alerts all technicians that the site is now in island mode operation. Unison Energy's monitoring team sends out a note on our internal messaging system, PowerIM: "Hainesport in island mode. Both engines operating normally."

Mark Cella, one of our Field Service Technicians, posts "On my way," and heads to the site, just in case. While Mark travels to the site, Joshua calls the store to let them know they are operating independent of the grid. The store manager, who hadn't even seen the lights flicker, walks outside and tells Joshua, "You're right, the entire area is out of power."

10:45 AM: ShopRite Burlington faults into island mode. PowerIQ once again sends out the automated alert. But this time, one of the two engines faults from the utility power surge just prior to the loss of power and fails to restart. The primary engine provides store power for 65% of the facility requirements, beginning with priority loads. While David Schmalacker, Unison Energy's lead CHP Engineer, located in Germany, works to clear the faults and resolve the situation, Mark climbs into his truck and heads to Burlington,

only 15 minutes away. On his way, he phones store manager, Bill Trefz, talking him through the required on-site reset. Once the second engine is restarted, the entire store is being run by the microgrid.

Burlington will continue to run independent of the utility until 7:37 PM on Wednesday.

1:03 PM: ShopRite Oakland, 90 miles to the north of Hainesport and Burlington, slips into island mode. Chris Agbasonu, Unison Energy technician for New York City, has been mobilized to New Jersey for coverage. Immediately, Charles Culver, Director of Refrigeration & Energy Management for ShopRite SRS, calls Willis McCullough, Director of Key Accounts, to find out what just happened.

Willis shares the PowerIQ status update: “The microgrid has been operating independent of the grid in island mode for seven minutes, providing 762 kW of power. Apparently, our technician is on site, confirmed everything is operating normally, and just talked to the store manager.” Charles responds, “Thanks, I need to deal with the other five locations I have without power and no backup.”

Oakland will operate independent of the utility for the next six days.

2:04 PM: ShopRite Plainview’s utility breaker trips and the units shift into island mode, keeping the store fully operational. This is the first location on Long Island to lose utility power — but not the last. Unison Energy technician Raesion Murray alerts the store manager that they are operating independent of the grid and he will remain nearby throughout the storm in case of outages.

Plainview will remain operating independent of the grid until late in the evening on Wednesday.

2:11 PM: ShopRite Bay Shore goes into island mode and the team receives yet another alert from PowerIQ: “Bay Shore island mode triggered. Utility breaker open. Operating in island mode.” As part of Unison Energy’s safety procedures, Raesion posts a PowerIM message — “On-site, disregard all alarms” — to alert the monitoring center not to restart engines while technicians are on site.



2:17 PM: ShopRite Port Jefferson goes into island mode and Raesion leaves Bay Shore, which is now operating normally, to travel to Port Jefferson and check on its operations.

2:18 PM: ShopRite Ronkonkoma shifts into island mode.

2:49 PM: ShopRite Selden goes into island mode, with Joshua on site to monitor the situation.

4:48 PM: At ShopRite Ronkonkoma, utility power is back and the breaker is closed. David, operating out of Germany, resets the controls and seamlessly transfers the system into grid parallel mode. But power surges from the storm have knocked out some fuses in the unit, so Raesion leaves Port Jefferson to travel to the site and replace the fuses.

9:05 PM: Having driven down from Long Island, Joshua arrives on site at **ShopRite Burlington** to relieve Mark, who has been back and forth between sites all day. Rob Joyce, VP of Engineering for Wakefern, the cooperative that includes ShopRite stores, has been monitoring PowerIQ. Rob texts Willis: “I looked late morning and none [of the Unison Energy-supported stores] were out. A few minutes later I had calls like crazy for generators but didn’t go back to look at the Unison app. Good to hear all transitioned normally.”



10:29 PM: Willis receives word from owner-operator Melissa Buonadonna: “[ShopRite] Massapequa and Babylon still down. Thank goodness for that generator in Bay Shore!”

Unison Energy Microgrids Provide Reliable Power as Outages Continue

By **Wednesday, August 5**, the storm has passed, but over two million customers remain without power across New York, New Jersey, and Connecticut.

Willis begins the day checking PowerIQ for system statuses and updates Rob Joyce: “As of 8 AM this morning we still have four stores in island mode: Bay Shore, Selden, Oakland, and Plainview. Ronkonkoma, Hainesport, Burlington, and Port Jefferson all seamlessly have transferred back to grid parallel at different times late afternoon or during the night.”

By **Thursday, August 6**, the service operations team is still closely managing the situation at some sites.

ShopRite Selden remains in island mode overnight, but Raesion receives the go-ahead from PSEG Long Island first thing in the morning and the store returns to grid parallel mode at 9:15 AM. At **ShopRite Bay Shore**, the utility approves a return to grid parallel but warns that the system may trip back into island mode due to ongoing repairs in the area. Chris, re-deployed back to Long Island for a shift change, keeps the system in island mode and plans to revisit transitioning that night.

Most of the sites soon return to grid parallel, but **ShopRite Oakland** remains in island mode until **Monday, August 10**, successfully weathering a six-day outage that could have been devastating for the store if it had not had reliable on-site power generation in place.

Achieving Resilient Energy with Microgrids and World-Class Operations

Throughout Tropical Storm Isaias, the Unison Energy team managed island mode for eight microgrids in New York and New Jersey, ensuring the sites had energy resiliency as they served their communities, with some sites remaining in island mode for almost a week. Most teams would count this as a success, congratulate each other, and return to normal operations.

Two days after the storm, while two sites were still operating independent of the grid in island mode, Scott Fiveland, VP of Operations, convened the first debrief: “As part of Unison Energy’s continuous improvement process, we will be evaluating our response to the storm, including preparations, parts availability, tools, monitoring team performance, communications systems, mechanical and electrical issues, all system faults, technician coverage, and most important, our safety protocols.” Even successful events at Unison Energy have important lessons to be learned. Careful attention to detail and continuous improvement is how we maintain our service excellence.

The Unison Energy service team can help your facility maintain resilient power during lengthy storm-related power outages. To find out more, contact a Unison Energy representative at sales@unisonenergy.com or visit us at www.unisonenergy.com.