

Solar and Storage Microgrids for Rural Community Health Centers

Rural community health centers depend on consistent and reliable electricity to serve their patients. Power outages pose a major risk to health center patients, who might need to defer or travel farther for care, and they have the potential to be massively expensive due to interruptions in service and loss of refrigerated vaccines and medications. As [power outages become more frequent](#) due to aging electricity infrastructure and extreme weather events, backup power systems can be a cost-effective investment. Solar+storage microgrids can provide reliable backup power during grid outages and cost savings year-round.

This document provides an overview of how solar+storage microgrids work, how they can benefit community health centers, and how these systems can be financed through programs such as the federally-funded [Solar+Storage Microgrids for Rural Community Health Centers Project](#).

What is Solar+Storage?

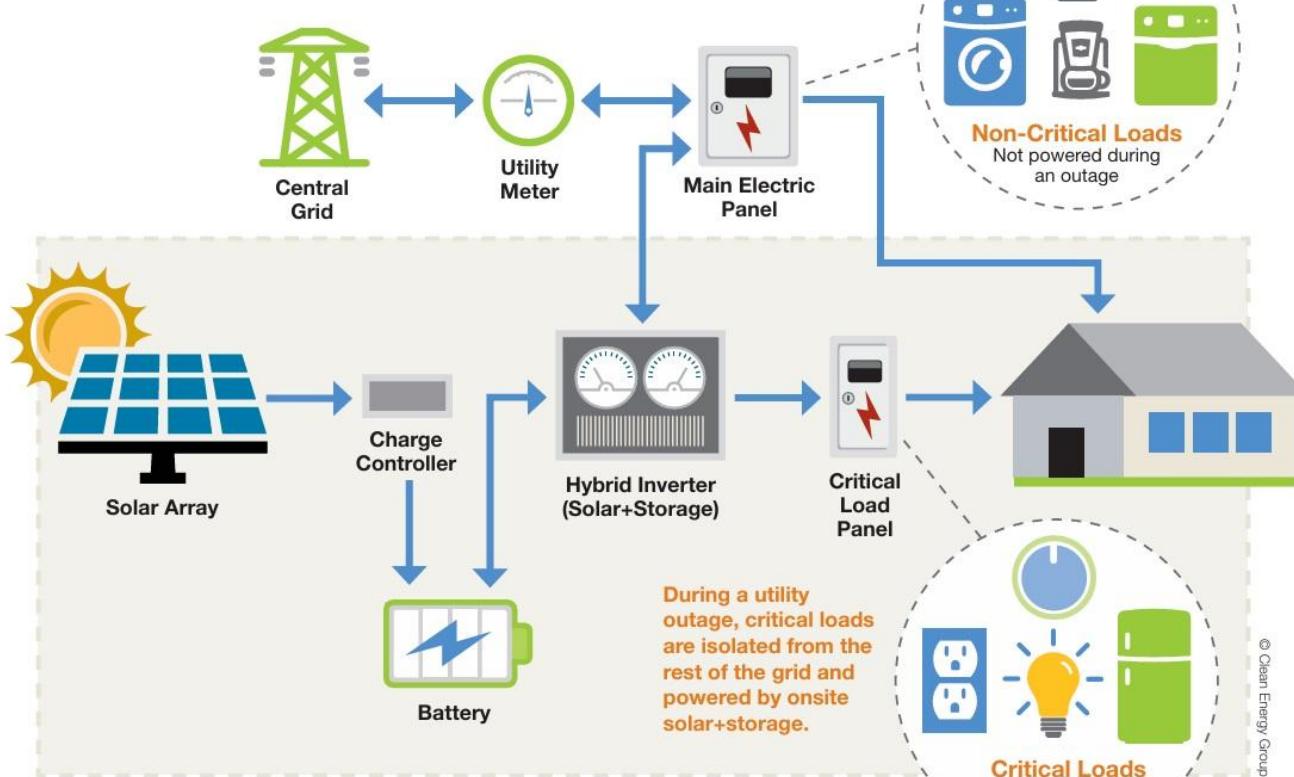
Pairing solar panels paired with battery storage (solar+storage) can provide a facility with continuous, reliable power in the event of a power outage. During the rest of the year, solar+storage can lower monthly electric utility bills.

What is a Microgrid?

In the event of a power outage, solar+storage systems can be configured to provide automatic, reliable, and uninterrupted backup power. This automatic transition from grid-tied power to grid-independent power is facilitated by a transfer switch, which allows the system to disconnect (or “island”) from the utility grid, and power the facility as a self-contained energy system called a microgrid. The solar+storage microgrid delivers backup power to a facility’s designated critical loads, or, if the battery is large enough, to the entire facility. A solar+storage system can be a sole source of backup power or paired with a fossil fuel powered generator (such as diesel).

- Clean Energy Group produced a 2-minute video explaining how solar+storage microgrids can provide backup power to community facilities in the event of a power outage – [watch it here](#).

Solar+Storage Backup Power System



Solar+storage systems designed to provide backup power include a transfer switch to disconnect from the utility grid and often incorporate a critical load panel. The transfer switch is typically incorporated as a component of the system's hybrid inverter, shown here in a DC-coupled configuration. When an outage occurs, the transfer switch isolates the solar+storage system from the grid along with the critical load panel. Any devices served by the critical load panel will continue to be powered by solar+storage, while those served by the main electric panel will not be powered during an outage.

For a more comprehensive introduction to solar+storage, see Clean Energy Group's publication [Understanding Solar+Storage: Answers to Commonly asked Questions About Solar PV and Battery Storage](#), available in English and Spanish.

The Problem with Diesel Generators

Today, the most common commercially available backup power option is a diesel generator. However, diesel generators can be unreliable, harmful to health, and do not provide any benefits during regular grid operations (such as reducing utility costs). Diesel generators cause an [estimated 100 deaths per year](#), mostly due to carbon monoxide poisonings resulting from improper use. They have a [high failure rate](#) if not



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regularly inspected and maintained. Diesel fuel can be [difficult to acquire](#) during or after severe weather events, especially for rural facilities. In contrast, solar+storage microgrids are reliable, do not emit hazardous pollutants, and are immune to fuel shortages.

How Can Solar+Storage Microgrids Benefit Rural Health Centers?

Solar+storage microgrids can provide a variety of benefits to community health centers by enabling increased reliability during outages. Reducing dependence on an aging or unreliable electricity grid, especially in outage-prone areas, can reduce disruptions in service, avoid the loss of refrigeration-dependent vaccines and medications, provide year-round cost savings and support communities in the event of a disaster.

CONTINUITY OF CARE DURING POWER OUTAGES

Community health centers cannot operate without electricity. Solar+storage microgrids can provide continuity of care for patients during outages. This protects community members and often prevents them from needing to travel farther distances to hospitals or emergency rooms in search of backup power. Uninterrupted service for patients with chronic conditions or those who rely on electricity-dependent medical devices can prevent life-threatening care delays.

Maintaining regular operations can provide support and safe environments for patients and staff, including:

- Refrigeration for medications and vaccines
- Powering and charging medical devices
- Uninterrupted IT and communications systems
- Access to electronic health records
- Continued use of lab equipment
- Operation of HVAC and lighting systems



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Health centers without emergency backup power sources [reported](#) potential daily losses of up to \$300,000, with an average of \$41,000 in losses per day, including loss of medication and vaccines, cancelled appointments, and staff-related expenses.

VACCINE AND MEDICATION REFRIGERATION

Many health centers that store temperature-regulated vaccines and medication on-site do not have a reliable source of backup power. An assessment found that 80% of Florida health centers store refrigerated medication and vaccines, but [only 40% of those facilities had on-site backup power](#).

YEAR-ROUND COST SAVINGS

In addition to avoiding costly losses during outages, solar+storage can directly reduce operating costs for community health centers by reducing utility bills year-round. Lower and more predictable energy costs can free up funds for health centers to provide expanded patient care, support staffing needs, and fund preventative health programs. This increased financial stability can support a health center's long-term ability to serve the community. The value streams of solar+storage include the following:

- Solar panels generate electricity during the day, which reduces the amount of power a facility has to purchase from their utility. This lowers annual electricity costs, which is especially valuable in the Southeast, where many utility companies are significantly increasing their rates.
- In states with solar net metering policies, excess energy can be sold back to the electricity grid in exchange for credits, which can offset electricity use at night or on days when solar production is lower.
- Battery storage allows health centers to store their solar energy and use it during peak demand hours, when electricity is most expensive. In some places, utility demand charges can account for more than 50% of a monthly electric bill.
- Where available, health centers can enroll in utility or state incentive programs and participate in utility demand response programs that provide additional savings.

DISASTER RESPONSE

Community health centers are trusted institutions where people can come for safe, reliable support. With a solar+storage system, health centers can better collaborate with local organizations and emergency management agencies to ensure communities are prepared to respond to natural disasters.

When powered by a solar+storage microgrid, community health centers can serve their patients and the broader community during a natural disaster by providing essential medical services and stable infrastructure. In addition to their existing services, health centers can also support their communities by:

- Acting as a cooling or warming center during extreme heat or cold
- Assisting people with electricity-dependent medical needs
- Distributing emergency information in multiple languages
- Helping community members navigate evacuation plans, locate shelters, or seek assistance
- Providing access to phone charging and supporting emergency communication needs

CASE STUDY: Solar+Storage at the CrescentCare Community Health Center

CrescentCare Community Health Center provides mental health, medical, and supportive services in New Orleans and Southern Louisiana.

When Hurricane Ida struck Louisiana in 2021, it severely damaged the electricity grid, leaving over a million residents without power. This created a major public health emergency, particularly for medically vulnerable people who rely on electricity to refrigerate medications like insulation or to power essential medical equipment.

After the hurricane, CrescentCare was forced to close one of its clinics after the facility's backup diesel generator failed. Like many health centers, CrescentCare's emergency plan was to transfer temperature-sensitive medications to partner facility, but, unfortunately, the partner facility's generator also failed. This resulted in over \$1 million in combined losses. The disruption in power exposed critical vulnerabilities in emergency preparedness for CrescentCare and other community health centers during power outages.

In response to these losses, CrescentCare installed a solar+storage backup power system at its St. Roch clinic. The system includes a 128-kilowatt rooftop solar array and a battery storage system paired with an existing natural gas generator. The solar+storage microgrid is able to power the health center for up to 10 days during a grid outage. The solar+storage system allows CrescentCare to maintain critical operations during outages, including cold storage of vaccines and medications, IT systems, and continued patient care. In addition to avoiding the potentially high costs of power outages, the solar+storage system also saves the facility roughly \$24,000 annually on energy costs.



*Solar array at CrescentCare Health Clinic.
Photo Credit: Together New Orleans.*



*Battery storage at CrescentCare Health Clinic.
Photo Credit: CrescentCare.*

Learn more about the CrescentCare Health Center's solar+storage installation [here](#).

Solar+Storage Microgrids for Rural Community Health Centers

The Solar+Storage Microgrids for Rural Community Health Centers Project aims to increase energy reliability and improve access to health care in low-income, rural communities across eight states in the Southeast (AL, FL, GA, KY, MS, NC, SC, TN) and six federally recognized Tribes. The project is funded by the U.S. Department of Energy Office of Clean Energy Demonstration through the Energy Improvements in Rural or Remote Areas (ERA) program. Funding available will cover up to 70% of the cost to assess, design, and install solar and battery systems at participating health centers.

The Solar+Storage Microgrids for Rural Community Health Centers Project is a collaboration between Clean Energy Group and the CHARGE Partnership – comprised of the National Association of Community Health Centers (NACHC), Capital Link, and Collective Energy Company.



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[Learn more and apply on the NACHC website.](#)