Building Resilient Health Center Facilities Utilizing Solar+Storage Microgrids





Introduction

Power is critical to the delivery of health care services. Federally Qualified Health Centers (FQHCs) rely on electricity to access patient records, operate medical and diagnostic equipment, and keep medication and vaccines refrigerated. When the power goes out, FQHCs face serious costs – not only in lost revenue from patient visits and contaminated medication – but in their ability to deliver critical health services to communities in need.

As climate- and weather-related electrical outages become more commonplace across the U.S., a growing number of Federally Qualified Health Centers (FQHCs), including health centers in California, Colorado, Louisiana, Florida and Puerto Rico, have installed solar photovoltaic (PV) systems and battery storage ("solar+storage") microgrids to ensure continuity of care during power outages, reduce operational costs, and enhance their energy resiliency and sustainability.

At the same time, the Inflation Reduction Act of 2022 (IRA) includes landmark provisions designed to make clean energy solutions more affordable and accessible, especially for nonprofit organizations serving vulnerable and disadvantaged populations. The populations and communities highlighted in the legislation overlap strongly with the people and places served by FQHCs. Together with the <u>Justice40</u> initiative—designed to ensure that 40 percent of the overall benefits of certain federal investments flow to communities that are marginalized, underserved, and overburdened by pollution—these federal incentives make installing solar+storage microgrids increasingly affordable for FQHCs.

This resource explores the benefits, opportunities, challenges, and financing resources for FQHCs looking to install solar+storage microgrids. To help you better understand how this clean energy solution might benefit your health center and the community you serve, we highlight case studies of health centers that have successfully implemented solar and battery back-up systems and provide links to relevant resources.

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FQHCs are uniquely positioned to support our most vulnerable populations during extreme weather events and serve as resiliency hubs for communities across the country. Yet unlike hospitals, they are not required by the Center for Medicare and Medicaid Services (CMS) to have three days of backup power or generation capacity. Without reliable back-up power, in events of emergency, underserved populations are once again at risk of being left behind.

Solar+storage backup systems offer clean, cost-effective, reliable power generation and energy storage, helping ensure FQHCs and other critical facilities stay powered. By helping to ensure that these critical facilities can operate during planned outages, electrical grid failures, and natural disasters. Solar+storage backups prevent financial loss, reduce energy costs, and ensure FQHCs can continue to serve their communities even when the grid goes down – all while reducing their reliance on fossil fuels.

With new federal clean energy incentives, installing solar+storage back-up systems is more affordable than ever. Policy initiatives aimed at bringing clean energy resources to communities most impacted by climate change, pollution, and environmental hazards make these systems increasingly accessible. As the number of climate- and weather-related power outages and emergencies continue to rise – and FQHCs continue to help their communities respond to them – the question FQHC leaders should be asking themselves is not "Why consider clean energy microgrid systems for emergency back-up?" but "Why not consider clean energy microgrid systems for emergency back-up?"



This map highlights 18 separate billion-dollar weather and climate disasters that impacted the United States in 2022. When disaster strikes, health centers are often called upon to aid in the response. (Image from the <u>National</u> <u>Centers for Environmental Information</u>)

What Is A Solar+Storage Microgrid?

A solar+storage microgrid is an integrated energy system that combines solar photovoltaic (PV) panels, energy storage batteries, and other control systems to generate and manage electricity. The system is designed to operate independently off the grid or in conjunction with it and provide reliable and resilient power to a facility such as a health center.

The solar panels generate electricity from sunlight, which can be used to power the health center's energy needs. Batteries store excess solar energy during the day for use during periods of high demand or power outages. The control systems manage the flow of electricity and ensure the system operates efficiently and safely.

By combining solar PV panels and energy storage, a solar+storage microgrid can provide reliable and sustainable power to a health center, even during grid power outages or other emergency situations. The system can also reduce the health center's reliance on the grid, significantly lower operational costs over the life of the system and reduce carbon emissions.

In many parts of the country, federal and state incentives for clean energy reduce the costs of installing solar+storage systems such that a health center can install the system at minimal cost, often financing the system for the cost of their monthly electric bill. We will review the various solar incentive programs and ways to finance solar+storage microgrids later in this publication.

CASE STUDY



Photo courtesy of MCHC

Mendocino Community Health Clinic Mendocino, CA

Years of record-breaking fires and high wind events in California have led to statewide preventative utility shutoffs (PSPS) leaving millions of people and hundreds of critical health facilities without power for days on end. PSPS outages in the state have affected 9 billion customer minutes since 2013, shutting down health services and directly leading to the loss of financial resources and long-lasting consequences for the communities.

In Mendocino, CA, for example, a planned power shut down in 2019 caused the closure of all four of <u>Mendocino Community Health Clinic's</u>

(MCHC) facilities, resulting in approximately 2,400 missed patient visits and the loss of vaccines and medicine, staff income , and \$300,000 in patient revenues.

In 2020, MCHC installed a large-scale solar+storage

system at a cost of \$1 million. If the current trend continues, and the health center loses power for even just one day a year, they will recoup their investment within four years. Furthermore, with the fixed electricity costs offered by their power purchase agreement (PPA), they will save on energy costs over the next 25 years. (Source) Solar+storage microgrids offer health centers the following benefits:

1. Back-up Power During an Outage

Solar+storage microgrids enable health centers to generate their own electricity during the day and store excess power for use at another time, improving their energy resiliency and sustainability. As solar+storage microgrids continue to provide power in the event of a power outage or other climate-related emergency, FQHCs can continue providing services and maintain continuity of care for patients and residents.

2. Lower Electricity Costs

Solar+storage microgrids can provide significant operational cost savings for FQHCs. By generating their electricity through solar PV systems, FQHCs may:

- Reduce their reliance on the grid,
- · Lower and/or stabilize their electric bills and
- Avoid being charged extra during times of peak electricity demand

In 2022, San Ysidro Health's Mountain Health Family Medicine clinic in Camp, CA, installed a 149-kilowatt solar photovoltaic system. This will reduce carbon emissions by an estimated 2,404 metric tons over the systems' lifetime, while reducing the health center's electricity costs by an estimated \$1.5 million.¹

3. Avoid Costly Downtime Expenses

Solar+storage microgrids can help health centers avoid costly downtime expenses that may occur during power outages, including:

- Lost vaccines and medications due to lack of refrigeration
- Revenue interruption from missed patient visits^{2 3}
- Interruption of vital services at critical times, such as maternal/fetal care, birth centers, behavioral health, and urgent care

^{1.} Source: San Ysidro Health-Mountain Health Family Medicine Campo – BQuest Foundation

^{2.} In March 2023, the Center for Medicare and Medicaid Services issued waiver permitting the use of alternative power sources (include solar+storage microgrids) for emergency backup in lieu of diesel- or gas-powered generators.

^{3.} In states like Massachusetts, where the Department of Public Health requires vaccines to be stored in refrigeration units plugged into the wall, solar+storage microgrids that keep power up and running provide an acceptable alternative to non-compliant free-standing battery-powered units. (Source)

4. Environmental Benefits

By installing solar+storage microgrid systems, FQHCs can significantly reduce their carbon footprint and contribute to a more sustainable future. These systems offer the following environmental benefits for FQHCs and their communities:

- Lower carbon emissions from clean power
- Reduced dependence on fossil fuels
- · Improved resiliency on the local electrical grid



This illustration shows the projected performance for a solar+storage system designed for a health center in Sacramento, CA. The system provides the health center with monthly cost savings on its electric bill while lowering its carbon footprint. (Source)

5. Enhanced Resilience for the Community

In addition to providing resilient backup power to health centers, solar+storage microgrids allow FQHCs to strengthen the resilience of their communities, providing residents with a central location where residents can come during power outages for information and vital services, including cell phone charging, medicine storage, heating/cooling stations, and the powering of oxygen exchange and light medical equipment.

CASE STUDY



Photo courtesy of CrescentCare Facebook page

Crescentcare Community Health Center New Orleans, LA

CrescentCare Community Health Center in New

Orleans, LA, lost over \$250,000 in life-saving medicines and vaccines when the health center's gas-powered generators failed at two New Orleans locations during Hurricane Ida in 2021. Patients were also unable to access certain health services, including electronic health records and essential medical equipment. Installing solar+storage battery backup helps Crescent Care's leaders ensure that when the next disaster strikes, the health center will be ready.

Today, CrescentCare is a designated local "resilience hub," one of 85-100 local community organizations that will be able to assess need and provide assistance to surrounding neighborhoods during natural disasters that cause the power to go down. When power outages occur, resilience hubs conduct needs assessments and provide for those needs by offering charging stations/small battery distribution, food preparation and distribution, cooling/heating stations, oxygen exchange/light medical equipment, and, in the case of CrescentCare, basic healthcare services. (Source)

IRA Makes Solar+Storage Systems More Affordable Than Ever for FQHCs

<u>The Inflation Reduction Act of 2022 (IRA)</u> includes landmark provisions designed to make clean energy solutions more affordable and accessible for nonprofit organizations serving vulnerable and disadvantaged populations, including FQHCs. The legislation updated and expanded the renewable energy <u>Investment</u> <u>Tax Credit (ITC)</u> for solar and battery storage resilient power projects, such that:

- Nonprofits with no tax liability (including FQHCs) can now apply for direct pay reimbursement equal to the value of the tax credit
- Storage-only projects are now eligible for the ITC
- The ITC now includes several "bonus credits," which can significantly increase savings for projects serving low-income and underserved communities

In short, solar+storage microgrids placed in service before 2033 are eligible for a baseline credit equal to 30% of the eligible costs of the project, effectively reducing the overall project cost. In addition, projects <u>may be eligible</u> for up to six bonus credits raising the value of the tax credit to up to 70% of eligible installation costs.



Health centers have two main ways to pay for a solar+storage microgrid:

1. Direct ownership

Direct ownership means the health center purchases the system upfront and owns all of the power it generates for the life of the system. The health center is also responsible for maintenance and repairs to the system, which should be minimal and are typically covered through warranties. This is the most straightforward option and makes the most sense for health centers that have or can access the resources to pay for the system directly. These may include:

- Upfront cash purchase
- Financing as part of a larger capital project plan
- Obtaining a loan (debt) for the project
- Fundraising private grants and donations, and/or
- Accessing federal and state incentives and grants

With new incentives available through the IRA, the cost of direct ownership may be within reach for many health centers for little more than the price of the health center's monthly electric bill.

2. Third-party ownership (if available within your state)

Third-party ownership means that another entity owns and operates the system and sells the power generated to the health center on a monthly basis. The key benefits of this option are that the health center incurs no upfront costs and is not responsible for maintenance or repairs to the system. Third party ownership is currently available in 28 states. Visit the <u>EPA website</u> to determine whether your state is one of them.

Pros and Cons of Direct vs. Third-Party Ownership

	Direct Ownership	Third-Party Ownership
Pros	Receive 100% of energy savings. Own all credits, tax benefits and incentives associated with the project.	No upfront costs. Reduced electricity costs. No maintenance or insurance costs.
Cons	Requires upfront investment or loan. Responsible for maintenance and repair (though likely covered by warranties). May need to increase insurance.	Long-term contract. May not receive all of the energy savings. Not available in <u>all states</u> .

Financing Options for FQHCs

Within these two ownership models, there are a variety of financing options, including loans, leases, cash rebates, and grants. While the viability of different options will vary based on a health center's financial position, federal and state incentives, and local market factors (costs of labor, utilities, etc.), the health center should consider the following:

- Pay cash upfront: If your health center has sufficient cash on hand, paying for the system outright may make the most financial sense. In many states, particularly those with high electricity costs, the net energy savings from the power the system generates may provide a higher return than the cash is earning in your bank account. The health center can use the savings on electricity to re-establish the account over time.
- Finance costs as part of a larger capital project plan: If your health center is planning a capital project to build a new or expanded facility in the near future, consider including the installation of a microgrid in the project planning and financing. Solar installations have been effectively included in New Markets Tax Credit (NMTC) transactions, providing investors with additional tax incentive for participating in the structure. Some states have recently provided funding for capital projects legislatively (Massachusetts and Missouri) which may have incentives in the competitive applications for greening.
- Obtain a loan: Debt is another tool FQHCs can use to pay for a solar+storage microgrid. Look for financing at a rate and term where your monthly payment will be covered by the energy savings associated with the project.

CASE STUDY



Photo courtesy of Pueblo Community Health Center

Pueblo Community Health Center Pueblo, CO

Pueblo Community Health Center (PCHC) is the first zero-energy health center in the U.S. and serves over 22,000 people annually. PCHC included solar installation as part of a \$32.6 million facility expansion, with renewable energy projects costing around \$1.5 million. PCHC has 160 kW installed on its roof, and another 120 kW installed on the parking lot carports, which generate enough electricity to offset the entire building's usage on a net-annual basis.

In PCHC's first year of solar, 435,744 kWh were produced, and 194,784 kWh were sent back to the Black Hills Energy Utility Company. PCHC has saved an estimated \$67,488 in utility costs in its first year of solar. Costs will continue to be saved annually as PCHC has become resilient to planned and climate-driven power outages. PCHC will be able to serve its community for decades thanks to renewable energy efforts. (Source)

How to Finance Solar+Storage for Your FQHC

- Access federal, state, and local grants: See the <u>Database of State Incentives for Renewables and</u>
 <u>Efficiency</u> for a searchable list of incentives by state and zip code.
- New Markets Tax Credits (NMTCs): As described above, some nonprofits have utilized NMTC structures to help finance solar projects, which can be complicated. With new federal incentives under the Inflation Reduction Act (IRA), FQHCs may not need to consider these transactions unless an existing NMTC transaction is already underway.
- Power purchase agreements (PPAs): In this third-party ownership structure, the FQHC leases its roof to a third party, which installs, owns and operates a solar project there, and enters into a long-term contract to purchase the power generated by the system at a fixed rate typically lower than the customer would pay the utility, for a set period of time. The health center gets reliable, affordable electricity without spending money upfront; the third party assumes all responsibility for installing, repairing, and maintaining the system. The third party uses tax credits and makes money from selling the electricity to the FQHC. PPAs are often used for renewable energy systems, but they can also be used for other energy technology like combined heat and power (CHP).⁴
- Energy Service Agreements (ESAs): An energy service agreement, similar to a PPA, allows an FQHC to undertake an energy efficiency improvement such as installing a solar+storage microgrid without incurring any upfront capital expenditure. This pay-for-performance arrangement is off-balance sheet: the ESA provider covers all the costs associated with project development and construction. Once the project is up and running, the health center makes service charge payments based on the actual energy savings achieved. The cost per unit of savings is a fixed output-based charge set at or below the customer's current utility price, resulting in an instant reduction in operating expenses.⁵
- Solar leases: The solar lease model is another common model of solar financing. In this third-party
 ownership model, the FQHC signs a contract with a solar developer or installer to lease a system over
 a period of time. Unlike a PPA where the FQHC pays a fixed rate for electricity based on kilowatts
 generated, or an ESA, where the FQHC makes payments based on savings achieved. Under a solar
 lease, the FQHC agrees to pay a fixed monthly rate to lease a system over time, regardless of how
 much power is generated or consumed. The FQHC incurs more risk under this option because savings
 are not "baked in" to the leasing agreement.

In addition to the direct and third-party ownership options described above, a health center could also purchase clean power by entering into a <u>community solar subscription agreement</u>, a contract to purchase power generated by a system owned by a third-party, typically located at a different location, and pair that power with an onsite battery storage system for back-up. Under this option, if the electrical grid went down, the health center's power would be limited to the amount of power stored in the battery – a limitation if the grid remains down for an extended period of time. Community solar is currently available as an option in about a third of all states.

4. More information here.

^{5.} More information here.

Recent Developments

The federal and state regulatory and policy landscape for clean energy and energy efficiency continues to evolve as policymakers and authorities issue guidance to respond to provisions of the IRA and other policies around climate, health, and disaster response. Health center leaders should be aware of the following two recent developments that make solar+storage microgrids a more cost-effective solution for emergency back-up power, while affirming their viability as an approved alternative to gas- and dieselpowered back-up generators.

Greenhouse Gas Reduction Fund

The IRA authorized EPA to implement the <u>Greenhouse</u> <u>Gas Reduction Fund</u> (GGRF), a historic \$27 billion investment to mobilize financing and private capital to combat the climate crisis and ensure American economic competitiveness. The GGRF will deliver lower energy costs and economic revitalization to communities, particularly those that have historically been left behind.⁶

Center for Medicare and Medicaid Services (CMS) Permits Use of Alternative Power for Emergency Back-up

On March 31, 2023 the Center for Medicare and Medicaid Services (CMS) issued a categorical waiver permitting new and existing health care facilities that are subject to CMS requirements (with the exception of long-term care facilities) to utilize sources of power other than a generator set or battery system. The waiver specifies that the alternative sources must be in accordance with the 2021 edition of the National Fire Protection Association (NFPA) Health Care Facilities Code (NFPA 99). The 2021 edition of the NFPA 99 permits emergency power for an essential electrical system (EES) to be supplied by sources other than a generator or battery system, including a health care microgrid system (HCMS). This clears the way for health centers to deploy clean energy systems, including solar+storage microgrids as an alternative to (or in addition to) fossil fuel-powered generators or back-up systems.

CASE STUDY



Photo courtesy of Atlantic Medical Center

Atlantic Medical Center Barceloneta, PR

Atlantic Medical Center in Puerto Rico used to run its operations on two generators. When 2017's Hurricane Maria knocked out the power grid, staff were concerned that if one or both generators failed or needed maintenance, there would be no support to continue providing services. Procuring diesel for these generators became an issue after the hurricane, when it was in short supply across Puerto Rico. Homebound patients could not visit the center, and roads as well as the local transportation system were down.

With support from <u>Direct Relief</u>, solar units now power the clinic's data center, generators, pharmacy, and laboratory. Supplies and vaccines that would be lost if exposed to fluctuating temperatures remain viable. The emergency room, currently powered by a generator, now has a backup source of power in case of future emergencies. Finally, the project has decreased energy costs by over 50% per year.

^{6.} The GGRF will be implemented via three formal grant competitions, which the EPA the plans to open by summer 2023.

Technical Assistance

Making sense of the different options for solar+storage microgrid financing is no easy task, and health centers have a unique set of considerations and concerns to address. Federal incentives for installing clean energy are set to expire in 2032, and many of the "adder" incentives available for low-income and other underserved communities are expected to fill well ahead of that time. For these reasons, there is an urgency for health center leaders to consider clean energy solutions.

In 2022, the National Association of Community Health Centers (NACHC), Capital Link, and Collective Energy joined forces to create the Community Health Access to Resilient Green Energy Partnership (CHARGE). CHARGE seeks to educate FQHCs on solar + storage options and provide assessment, design, installation, and financing to make clean and reliable energy easy and affordable. CHARGE will also work with health centers to evaluate – and may be able to provide up-front funding for – the solar installation, as well as access rebates which may result in discounted and low interest loans with no payments until the system is placed in service. CHARGE is developing free resources to help FQHCs understand their options for solar+storage microgrids, as well as a database of case studies of health centers that implemented these solutions. CHARGE's objective is to offer turnkey clean energy solutions for FQHCs looking for backup power that reduces operating costs while lowering their carbon footprints and ensuring continuity of care during utility outages.

Conclusion

During a natural disaster, a health center's main priority is providing care to its patients. Solar+storage microgrids give FQHCs the security of knowing that losing power does not automatically mean halting operations or suffering outage-related money losses. Through resilient and affordable emergency back-up power that can prevent outages when the grid goes down. Solar+storage microgrids allow health centers to maintain continuity of care for patients and operations, while decreasing potentially burdensome power-related losses. Microgrids also offer meaningful energy savings and a reduction in carbon emissions, allowing health centers to stabilize their operating costs while contributing to the fight against climate change. With the IRA's new solar incentives combined with existing programs, solar+storage grids are more affordable and accessible for health centers than ever before.

Resources

N.C. Clean Energy Technology Center Database of State Incentives for Renewables and Efficiency

CHARGE Partnership

US Environmental Protection Agency article "<u>Understanding Third-Party Ownership Financing</u> <u>Structures for Renewable Energy</u>"

US Environmental Protection Agency Greenhouse Gas Reduction Fund

The US Department of Energy

- Better Buildings Solutions Center:
 - » Power Purchase Agreement
 - » Energy Service Agreements
- <u>Community Solar</u>

Clean Energy Group

- Publications Library
- <u>Renewable Energy Investment Tax Credit</u>
- Investment Tax Credit Fact Sheet on the Bonus Credit Program

Solar United Neighbors Solar FAQs

National Association of Community Health Centers Blog Post, "<u>Climate Change and Community Health</u> <u>Centers</u>"