RESILIENT POWER PROJECT CASE STUDY

The Kenzi Apartments

Resilient Solar+Storage for Low-Income Seniors in Boston

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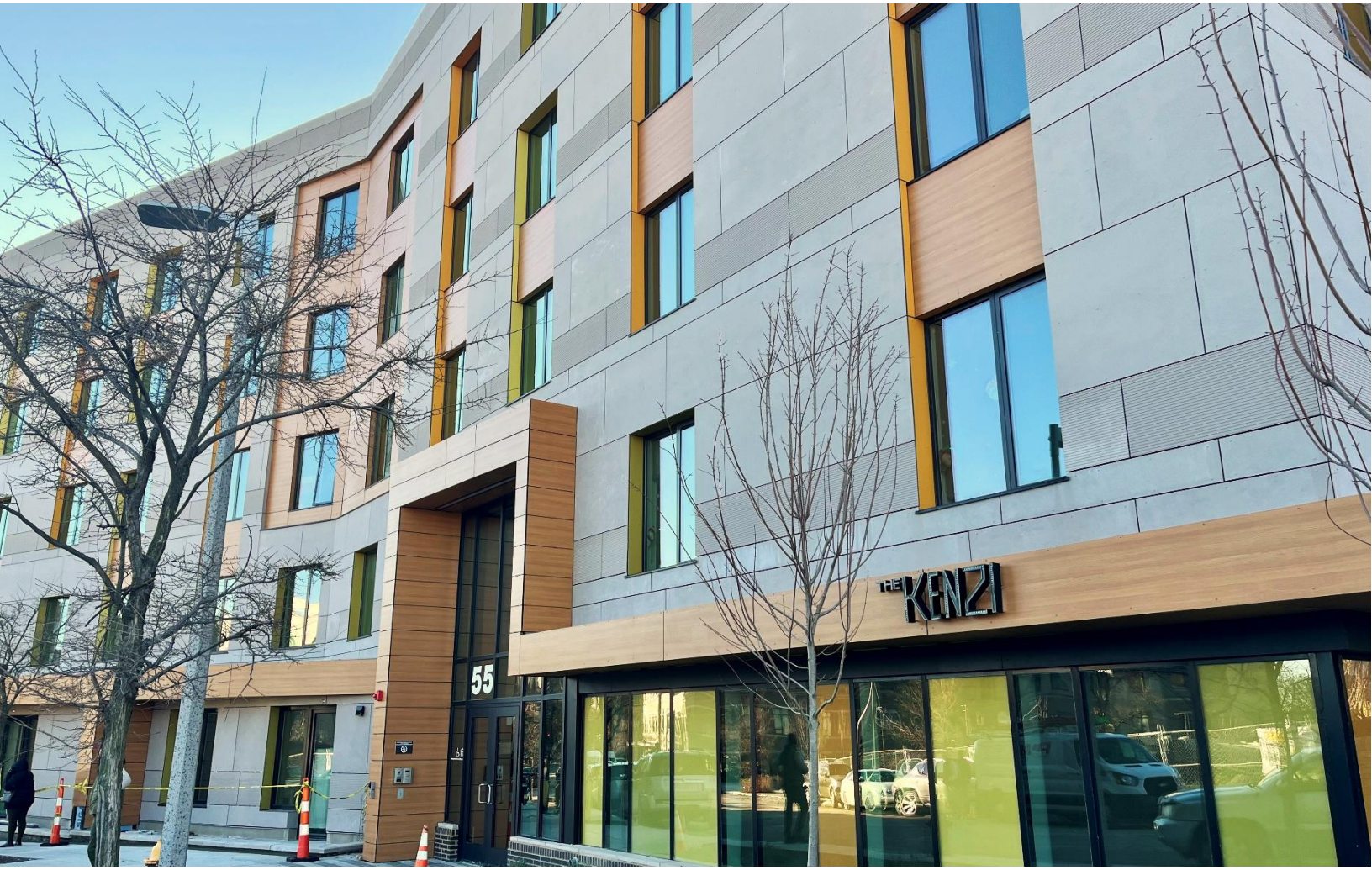

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RESILIENT POWER PROJECT CASE STUDIES

This case study is one in a series by Clean Energy Group (www.cleanegroup.org) produced as part of the Resilient Power Project, which aims to accelerate the equitable deployment of clean, affordable, and resilient power technologies in historically marginalized and underserved communities nationwide. This case study series highlights installations of solar combined with battery storage (solar+storage) to demonstrate their economic, community resiliency, and health benefits. More information about this project and others can be found at www.resilient-power.org.

ACKNOWLEDGEMENTS

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DISCLAIMER

Cover image: The Kenzi Apartments in the Roxbury neighborhood of Boston, Massachusetts. Photo by Clean Energy Group.

The Kenzi Apartments

Resilient Solar+Storage for Low-Income Seniors in Boston

PROJECT CONTACTS

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LEARN MORE

Clean Energy Group produced a 2-minute video profiling the solar+storage installation at the Kenzi apartments. Watch it here: www.cleanegroup.org/kenzi-video

This project was supported by Clean Energy Group's Technical Assistance Fund.
Learn more at www.cleanegroup.org/initiatives/technical-assistance-fund

Read more about the Kenzi apartments on the Preservation of Affordable Housing website: https://www.poah.org/property/massachusetts/kenzi-bartlett-station

The Massachusetts Clean Energy Center has a short case study on the solar and battery storage system at the Kenzi apartments. Read it here: www.masscec.com/resources/battery-backup-multifamily-housing-case-study

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SOLAR+STORAGE FOR THE KENZI APARTMENTS

A resilient power system at a low-income senior housing development in the Roxbury neighborhood of Boston provides clean, reliable energy through power outages.

THE CHALLENGE: Providing Low-Income Seniors with Reliable Energy and Backup Power

Power outages can be life-threatening for people whose access to electricity is a medical necessity. Elevators, refrigeration for food and medication, lighting, outlets for charging cell phones or medical equipment, heating and cooling systems—all of these services are essential for medically vulnerable people.

Seniors are a group particularly at risk during a power outage. Older people are more likely to have multiple chronic comorbidities, with over 70% of people aged 65 and older having at least two chronic conditions.[1] A power outage could disrupt many home health care essentials, such as spoiled medication from loss of refrigeration, inoperable medical equipment, and reduced access to mobility aids like elevators and powered wheelchairs.

Moreover, low-income seniors are more vulnerable to energy price increases than other age groups. Older people in the United States have a higher energy footprint per capita,[2] meaning that energy costs take up a greater share of their monthly spending and can lead to high energy burden, especially for those with low incomes.

The Kenzi is an affordable housing apartment building for seniors located in the Roxbury neighborhood of Boston, Massachusetts. The building contains 50 units of housing, 44 of which are reserved for individuals aged 55 or older who earn at or below 80 percent of the area's median income, and five of which are reserved for formerly homeless Bostonians.[3] When designing the site, developers were motivated by the challenge of providing clean, reliable energy that would keep power accessible to residents through outages.

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[1] Zhu Xianshang et al., "About half of older adults have two of more chronic conditions at the same time: a systematic review and meta-analysis," Frontier Public Health vol 13 (2025). www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2025.1680745/full.
[2] Peipei Tian et al., "Higher total energy costs strain the elderly, especially low-income, across 31 developed countries," PNAS U.S.A. vol. 121, no. 12 (2024), doi.org/10.1073/pnas.2306771121.
[3] "The Kenzi at Bartlett Station," Preservation of Affordable Housing, accessed December 2025, www.poah.org/property/massachusetts/kenzi-bartlett-station.

The Roxbury Neighborhood

Boston's Roxbury neighborhood is considered an environmental justice community.[4] In Roxbury, 41.1 percent of residents are Black; 30 percent of residents are Hispanic or Latino. The median household income in Roxbury is $42,045, compared to Boston's $94,734. About 27.8 percent of Roxbury residents are below the poverty line, compared to 17.8 percent in all of Boston.[5] The 8.5 acres of land on which the Kenzi and the surrounding development were built, formerly called Bartlett Yard, was heavily polluted and had to be remediated before development could begin.

The Bartlett Station Affordable Housing Project

The Kenzi apartment building is one of 10 buildings that make up the Bartlett Station Affordable Housing Project. Located near Nubian Square in the heart of Roxbury, Bartlett Station is a mixed-use development with 367 housing units, a community gathering space, and commercial storefronts. Bartlett Station was developed to the LEED-Neighborhood development standard, with sustainable features such as green spaces, geothermal heat pumps, renewable materials, solar panels and battery storage, and more. The residential units are mixed-income: one-third of the units are affordable, one-third are moderate, and one-third are market rate. Construction on Bartlett Station began in 2017 and the Kenzi was completed in 2024.

In the early 2000s, Boston's then-mayor Tom Menino approached Windale Developers, a Roxbury-based development company, about remediating and developing Bartlett Yard. Formerly a bus yard, the land was a brownfield contaminated with toxic waste such as petroleum, heavy metals, and PCBs, and the abandoned buildings on the site contained asbestos and lead. Windale Developers collaborated with Nuestra Comunidad Development Corporation (Nuestra CDC), which focuses on closing the racial wealth gap in Roxbury and other Boston neighborhoods by developing affordable housing. Crucially, these developers

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[4] An environmental justice community is a neighborhood at higher risk of experiencing adverse human health or environmental outcomes, with significant representation of Black and Indigenous people of color and/or low-income people. Read more about environmental justice communities here: www.climatepolicydashboard.org/policies/climate-governance-equity/ej-community-definitions.

[5] "Boston in Context: Neighborhoods," Boston Planning & Development Agency, January 2025, www.bostonplans.org/getattachment/45b1d52a-e762-42a4-b81d-d52072bfda61.

engaged the community to learn about the neighborhood's wants and needs.[6] Between 2011 and 2013, the U.S. Environmental Protection Agency (EPA) awarded project developers a total of $1 million in cleanup grants for the site.[7] As of 2026, Nuestra CDC and Windale have completed the Kenzi and are continuing to redevelop the larger Nubian Square area in the center of Roxbury to include a grocery store, a community garden, more housing, and other community-centered infrastructure.

Construction of more apartments as part of the Bartlett Station Affordable Housing project. Photo by Clean Energy Group.

POAH: An Affordable Housing Developer Committed to Sustainability

Preservation of Affordable Housing (POAH), a national nonprofit organization dedicated to preserving, creating, and sustaining affordable housing, was selected by Nuestra CDC to develop the Kenzi. POAH owns the property; they coordinated financing, engaged the architect (DREAM Collaborative) and general contractor, and managed the building's construction. POAH incorporated their commitment to energy conservation and environmentally conscious building practices into the design of the Kenzi.

POAH has long been recognized as a leader in sustainability and energy efficiency for multifamily affordable housing, proactively implementing energy- and water-efficient upgrades and instituting broad emissions reduction measures. POAH has consistently been at the forefront of discussions about the importance of backup power and innovative approaches to energy resilience. In an effort to better understand their own portfolio's resilience, POAH conducted a comprehensive building survey in 2020. They analyzed 130 of their properties for vulnerability to power outages and availability of backup power. From this, POAH identified 20 priority senior housing sites that experienced frequent power outages but lacked a generator or other backup power source.

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[6] "Bartlett Station," Nuestra Comunidad Development Corporation, accessed November 2025, www.nuestracdc.org/bartlett-station.
[7] "R1 Success Story: Bartlett Station, Boston, Mass.," U.S. Environmental Protection Agency, accessed November 2025, www.epa.gov/brownfields/r1-success-story-bartlett-station-boston-mass.

The generators installed at POAH's affordable housing properties were generally limited to carrying certain code-required electrical loads, such as hallway lighting, life-safety systems (including fire sprinkler systems), and elevators. Although these loads are vital, they do not support the additional needs of medically vulnerable residents, which may force residents to relocate during an outage. This can be very difficult for residents with mobility restrictions and is especially dangerous in extreme weather conditions. Moreover, finding a resilience hub or other safe haven nearby with adequate capacity can be nearly impossible depending on the area. At the time of the survey, POAH had already begun prioritizing larger backup power systems with the capacity to enable more residents to shelter in place during outages.

> "Especially at POAH properties where seniors are the residents, it's so much more important for them to have access to spaces that are continually powered. Having to relocate in a power outage is, I think, traumatic."
>
> *Julie Klump, Vice President of Design and Building Performance, POAH*

THE SOLUTION: Resilient power systems to support vulnerable affordable housing residents

The Kenzi is Massachusetts' first all-electric building greater than four stories with a city-permitted battery energy storage system paired with a rooftop solar array (solar+storage). The 60-kilowatt (kW) solar array, coupled with a 440-kilowatt-hour (kWh) battery storage system, provides reliable backup power to emergency loads and communal areas, which supports residents in powering their medical devices, mobility aids, and other necessities in the event of an outage.

The Solar+Storage System

Solar+storage offers advantages that solar or battery storage alone would not be able to provide. The battery alone, fully charged, can power the building's critical loads for at least 12 hours. With additional energy production from the solar array recharging the battery, the system can run indefinitely through an outage, providing power to communal spaces and emergency loads such as elevators. Thus, solar+storage enables residents, especially medically vulnerable residents, to shelter in place during an emergency.

The Kenzi's 440 kWh battery provides emergency backup power in the event of an outage. During an outage, it keeps power flowing to the community room (an "area of resilience"), elevators, emergency lights, and select outlets in the hallways on

each floor. Similar to the system found in hospitals, red outlets in the Kenzi denote that an outlet will remain powered through an outage. Reserving the battery for the building's critical loads ensures that the battery can function throughout longer power outages while keeping power accessible to residents. The battery is recharged by a 60-kW rooftop solar array, which offsets building energy use during normal operations.

The rooftop solar array at the Kenzi apartments. Photo by Clean Energy Group.

The Community Room: An Area of Resilience

Though limited power is provided to the building during an outage, with many outlets and main lights inactive to reduce the building's energy load, one room remains fully powered and actively temperature controlled. The community room on the first floor of the Kenzi features a large refrigerator, fully powered outlets, lighting, heating, and air conditioning, all of which remain active during a power outage. Essentially acting as the building's own resilience hub, this space can be essential for residents during an outage, further enabling them to shelter in place.

Passive House Design

POAH invested in robust energy efficiency measures at the Kenzi. The building is airtight and has superior thermal insulation, making it extremely resistant to outdoor temperature changes. This is known as passive house construction; in the event of a power outage, the Kenzi can maintain its indoor temperature for several days with no energy required. During normal operations, it also requires less electricity to heat and cool the building, which can help to keep energy costs down. The building is certified under the Passive House Institute of the US (PHIUS+) standard.[8]

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[8] "The Kenzi at Bartlett Station," PHIUS, accessed March 2026, www.phius.org/certified-project-database/kenzi-bartlett-station.

Solar & Battery Storage System Details

Property and System Owner: Preservation of Affordable Housing (POAH)

Location: Boston, Massachusetts

Year Commissioned: 2024

Installed Cost: $1,000,000

Solar System Size: 60 kW solar array

Battery Storage System Technology and Size: 440 kWh lithium-ion battery energy storage system

Battery Vendor: KORE Power

Services Provided: Backup power, demand management, net metering

Building Loads Supported by the Storage System: Elevators, community room that doubles as a resiliency center for residents, select outlets in hallways, all emergency loads including lighting and the fire alarm and sprinkler system

Duration of Backup Power: At least 12 hours (battery only); indefinite with solar energy

Project Partners: Preservation of Affordable Housing (POAH); Clean Energy Group; Nuestra Communidad Development Corporation; SunBug Solar, now part of ReVision Energy; Massachusetts Department of Housing and Community Development; Neighborhood Housing Trust; Massachusetts Clean Energy Center

FINANCIAL DETAILS

Project Costs

In total, the solar+storage system cost $1 million. The system was funded in part by a $250,000 grant from the Massachusetts Clean Energy Center (MassCEC), the Low-Income Housing Tax Credit (LIHTC), and the Investment Tax Credit (ITC).

Anticipated Savings

The Kenzi plans to enroll in the Massachusetts ConnectedSolutions program in 2026. ConnectedSolutions is an innovative demand response program that offers incentives to residential and commercial electric customers in exchange for allowing the electric utility to draw on the energy stored in their battery during times of peak electric demand. This benefits all ratepayers in the utility territory by avoiding the need to build expensive additional energy generation facilities.

Clean Energy Group's Technical Assistance Fund

In 2020, POAH was awarded $7,500 through Clean Energy Group's Technical Assistance Fund to conduct a solar+storage feasibility assessment for the Kenzi. The assessment was conducted by SunBug Solar, now part of ReVision Energy.

The first steps to exploring solar+storage for a facility can be resource intensive; organizations must spend time and money to evaluate costs and benefits. Through the Technical Assistance Fund, Clean Energy Group seeks to reduce these early-stage project development barriers by funding solar+storage feasibility assessments for community-serving facilities. These technoeconomic assessments evaluate a system's potential design, including its cost, economic and resilience benefits, and emissions reduction potential. After receiving a solar+storage assessment, community facilities are better equipped to move to the next steps of project development.

The battery storage system at the Kenzi apartments. Photo by Clean Energy Group.

LESSONS LEARNED: Pioneering All-Electric Backup Power

Many multifamily affordable housing providers are required to have backup power for emergency loads such as elevators, fire-suppression pumps, and stairwell lighting. The International Building Code (IBC) recommends that buildings with four or more stories have a backup power source. Typically, this requirement is met through a fossil fuel generator. Alternatives like energy storage require additional steps to approval by code officials, inspectors, and fire departments to serve life safety loads.

Normally, a building greater than four stories in the city of Boston is required to install a backup diesel generator. Like all other buildings of its size in Massachusetts, the Kenzi initially included a diesel generator in its design. However, POAH later considered greener options. To support their efforts to reduce emissions, MassCEC provided POAH with a one-time grant of $250,000 to demonstrate how a battery

energy storage system can be code-compliant, negating the previously unavoidable need for a diesel generator.

In order for the battery system to be approved as the sole source of backup power, POAH, along with the Kenzi's architect, electrical engineer, and code consultant, met with the Boston Fire Department and Boston's Inspectional Services Division over the course of nine months. The City of Boston required POAH to demonstrate that the building included an emergency operations plan in case of fire, clear signage for the remote battery shutoff location, a specialized sprinkler system, and a building management system with communication between the battery and the fire alarm system.

The remote battery shutoff switch at the Kenzi apartments. Photo by Clean Energy Group.

The Boston Fire Department required that the battery alone could power emergency loads for at least 2 hours in the event of an outage. For the Kenzi, this meant that 70 kWh of battery capacity would always be reserved for emergency backup power, and an additional 70 kWh would serve as a safety margin. The Kenzi invested in a 440-kWh battery so that it could reliably support emergency loads as well as a community resilience center for residents to shelter in place. The Kenzi thus became a trailblazing example for how to develop fossil fuel-free multifamily buildings.[9]

Stakeholders in other states are also considering how battery storage could support emergency loads. The draft Connecticut Climate Resilient Energy Code estimates that critical loads for a typical multifamily affordable housing provider represent approximately 15 percent of the full building load during normal operations. It recommends that a solar+storage system provide a minimum of 24 hours of backup power to common area critical loads.[10]

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[9] "Battery Backup in Multifamily Housing: A Case Study in Code Compliance," Massachusetts Clean Energy Center, accessed February 2026, www.masscec.com/resources/battery-backup-multifamily-housing-case-study.

[10] "Draft Connecticut Climate Resilient Energy Code," Clean Energy Group, New Buildings Institute et al., www.cleanegroup.org/publication/draft-ct-climate-resilient-energy-code.

CONCLUSION

The Kenzi's pioneering model of a fully renewable energy system with fossil fuel-free backup power for lower-income seniors is a leap forward for clean, reliable energy in Boston and across the country. Too often, the needs of at-risk populations are an afterthought. The Kenzi not only considered but prioritized the medical and mobility needs of its residents. Its inclusion of a resilience hub and red plug outlets is an achievement in providing adequate care and preparation for medically vulnerable populations in the event of a power outage.

The greater Bartlett Square area is a lesson in reducing environmental risks in environmental justice communities while serving its residents. Land that was once a toxic brownfield is now an energy-efficient community hub with shops, businesses, and mixed-income housing.

The Kenzi's solar and battery storage system demonstrates how new housing projects, affordable or otherwise, can completely avoid reliance on fossil fuels, reduce risk factors during power outages, and keep energy costs affordable for residents.

"Knowing that backup [power] is available, I do feel more secure. I think it's wonderful for all of us, especially those who need it with medical issues."

Mary McDonald, Resident of the Kenzi

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