



BATTERY STORAGE FOR BACKUP POWER IN AFFORDABLE MULTIFAMILY HOUSING

GOODBYE NATURAL GAS

The NHP Foundation (NHPF) is committed to providing high-quality housing to their over 40,000 residents while also pushing the envelope of building design in multifamily affordable housing. At The Terraces at Park Heights in Baltimore, Maryland, NHPF showcased its ability to innovate by incorporating emerging technologies in the design and development of the property. Specifically, NHPF installed a battery energy storage system (BESS) to provide backup power to critical building systems in the event of a grid failure. As a result, they reduced both development costs for backup power by over 80% and peak electricity costs by 25%.

The multifamily affordable housing sector is a leader in adopting clean energy technologies such as solar energy and heat pumps for water heating and space heating and cooling. However, BESS are just beginning to make their entry into the sector, particularly as a source of backup power. By installing a BESS, affordable housing owners are able to replace fossil fuel-powered generators that rely on delivered fuels such as diesel or gas. State and local building and fire codes may complicate the adoption of BESS in multifamily housing as codes typically require a source of emergency backup power but may not address BESS directly. As a result, the pathway by which multifamily housing can comply with codes while also integrating BESS can appear unclear. In Maryland, however, state codes provided a clear pathway for BESS installation. The NHP Foundation also creatively used the BESS to reduce both development costs and operating expenses.

Achieving Tax Credit Investor Buy-In

NHPF committed to designing an all-electric property, and that goal extended to the site's backup power generation. Initially, the property's tax credit investor required The Terraces at Park Heights to install a gas generator because they had concerns around battery energy storage given the nascency of the technology in multifamily applications. However, NHPF worked with their MEP engineers and energy consultants to demonstrate that solar-plus-storage could provide sufficient critical load in the event of an emergency. After leveraging several incentives to help fund the battery, NHPF **reduced development costs for backup power from \$400,000 for the gas generator to \$75,000 for the BESS.**

CASE STUDY 2026



THE TERRACES AT PARK HEIGHTS AN NHP FOUNDATION COMMUNITY

Property Information

Location: Baltimore, Maryland
Number of Units: 100 Units
Population: Seniors
Year of Completion: 2025
Construction Cost: \$52 Million

Building Features

Green Building Certification: National Green Building Standard
Renewable Energy: Rooftop, carport, gazebo solar panels
Battery Energy Storage System: EndurEnergy Systems ESP-5K HL (64 kW capacity providing 8-hour reserve load)
Battery Energy Storage System Financing: Investment Tax Credit, Low-Income Housing Tax Credit, state clean energy grant
Hot Water System: 40-gallon in-unit Bradford White residential upright electrical water heater
Amenities: Fitness center, library, public computer center, coffee bar, community kitchen

Underwriting and Battery Storage

NHPF worked with their MEP engineers and energy consultants to estimate how the property's clean energy features would affect common area electricity usage. After receiving reports from their consultants that the battery system helped reduce electricity use, the property's investor accepted underwriting based on this lowered usage. As a result, NHPF was able to secure more loan proceeds to help finance the property's development.

Maryland Code Eases Compliance

At the time of construction, Maryland required multifamily properties to comply with the National Fire Protection Association (NFPA) 1, 2018 edition code. Chapter 52 of NFPA 1 outlines key fire safety requirements that NHPF needed to integrate into the design of the system so that the BESS could comply with code. NHPF's experience navigating building, fire, and energy codes required early and consistent coordination among the full project team, including the architect, MEP engineers, consultants, the general contractor, and key subcontractors. NHPF's experience demonstrates that proactive planning and interdisciplinary collaboration are critical to identifying code requirements early, coordinating system integration, managing permitting and inspection sequencing, and minimizing impacts to schedule, constructability, and budget. Additionally, maintaining ongoing communication with the Authority Having Jurisdiction and engaging all stakeholders throughout design and construction was essential to achieving successful project execution and compliance.

BESS Design Specifications

To comply with code requirements, NHPF added clear signage for the room with the BESS, smoke detection, and an NFPA 13 automatic sprinkler system. A fire extinguisher and cabinet sit next to the room with the system. Given the BESS' capacity and its location within the building footprint, NHPF placed the BESS in a room with one-hour rated walls and ceilings. The room is thermally controlled with a dedicated HVAC unit. The BESS is also connected to an isolated 600-amp panel that was sized based on the systems that proved necessary to power during an emergency. The battery can maintain power to critical systems in the building for up to 8 hours during a utility outage, including security cameras, access control, selective common area lighting, and community area climate control.

Arbitraging Electricity to Reduce OpEx

The Terraces at Park Heights resides in Baltimore Gas & Electric's service territory, and the utility has peak and off-peak electricity rates. NHPF uses the battery to arbitrage electricity costs by charging the battery during off-peak hours when electricity is cheaper and discharging the battery during peak hours when electricity is more expensive. This strategy has helped NHPF shave the property's peak electricity demand and **reduce peak electricity costs by 25 percent.**

Next Steps for The NHP Foundation

NHPF intends to build on its success with BESS at The Terraces at Park Heights. The organization is currently considering adding more battery storage capacity to allow it to both further reduce operating expenses and designate a reserve load capacity.



Rooftop solar on The Terraces at Park Heights

Key Takeaways for State and Local Governments

The success of The Terraces at Park Heights is a testament to both the The NHP Foundation's dedication to provide safe, resilient housing and the work of Maryland state government to adopt forward-thinking building, fire, and energy codes. As new technologies enter the market, state and local governments can be proactive about adopting new codes that allow nonprofit affordable housing to take advantage of them. This approach gives housing providers a clear path to install these technologies and avoid costly delays and regulatory pitfalls to adoption. State and local governments can begin by asking themselves the following questions:

- Do our codes and regulations allow affordable housing developers to install promising, emerging technologies?
- Do our codes and regulations align with our climate, energy, and resiliency goals for our communities?
- Are we providing the necessary incentives to allow multifamily affordable housing to leverage emerging technologies?



ESP-5K HL battery energy storage systems connected to Sol-Ark inverters