THE TOWER COMPANIES INSTALLS ROOFTOP SOLAR ON 1960S HIGH-RISE BUILDING WITH FULL OCCUPANCY

SOLUTION OVERVIEW
In 2019, The Tower Companies ("Tower") installed the largest rooftop solar PV system on a multifamily building in Montgomery County, Maryland. The 122-kW installation reduces almost 10% of the overall operating costs at Blair House, which is just one of their properties located on a 27-acre mixed-use development in which is collectively called "The Blairs". Instead of accessing third-party capital to pay for the project, The Tower Companies chose an ownership model approach and purchased the solar installation with no external financing required. With the support of federal and local incentives, the project is expected to achieve a 1-year after-tax payback. The Tower Companies partnered with local companies, Prospect Solar and WJE for engineering support, to complete the project.

CHALLENGE
Determining how to install cost-effective rooftop solar on a 1960s high-rise apartment building with an existing structure and near full occupancy.

SOLUTION
Worked with structural engineering and solar developer teams to assess roof capacity and redesign the installation, while combining federal and local incentives with a direct ownership model, avoiding the need for additional financing.

OUTCOME
With minimal disruption to residents, the project was completed in 4 months from mobilization to final utility interconnection and will achieve a one-year after-tax payback with roughly 30% internal rate of return over 20 years.

BUILDING DESCRIPTION
The Tower Companies is a privately-held real estate developer and property management company based in the Washington, D.C. metropolitan area. As part of The Blairs, a 27-acre mixed-use community, Tower developed Blair House in 1962 and continues to both own and manage the property. The building is a 12-story, 310-unit, 375,000-square-foot apartment building located in Silver Spring, Maryland, on the D.C.-Maryland border. It is LEED Gold and ENERGY STAR® Certified.

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PROCESS
Tower has supported renewable energy projects for over a decade through strategic purchases and on-site solar PV arrays to offset 100% of their portfolio’s carbon footprint. After completing their first on-site solar project in 2014, the Tower Team began to explore options for additional solar projects. Tower identified Blair House as an existing property that had great solar potential. This decision was based on factors including building age, roof age, roof condition, roof size, number of obstructions on the roof, shading, roof offset requirements, proximity to the D.C. feeder lines, access to building drawings, and the overall projected energy savings of the project.

Using experience from their 2014 project, Tower focused on the ‘direct purchase’ ownership model. The team had considered other financing solutions, including a direct ownership model that used debt financing and a third-party ownership model through a power purchase agreement or roof leases; however they determined that an internally-financed direct purchase ownership model made the most sense due to the quick, 1-year after-tax payback.

The biggest challenge the project faced was the existing roof. Tower had to work with a structural engineer to confirm roof capacity for all areas of the structure, which dated to the 1960s and was made of steel beams and corrugated metal decking, not reinforced concrete. Based on the final assessment, which involved several site visits, roof samples, and coordination with the property team and residents, the team redesigned the solar system to accommodate areas of the roof that could not hold the weight of the installation. In an effort to minimize disruption to residents, be mindful of future on-site maintenance needs, and consider general ease of construction and cost, the team had to be thoughtful about the racking system selection and electrical route from the roof to the metering infrastructure located in the basement. The installed solar system features 265 American-made modules with an estimated annual production of more than 150,000 kWh – almost 10% of the total building energy demand and enough to power the equivalent of 75 apartments. The system is connected to one of the utility electricity meters in the building that primarily serves amenity spaces and chillers. During months where power generation exceeds demand, Tower supplies the grid with the excess electrons and is credited on utility bills through local net metering laws.

The Tower Companies placed a dashboard in the lobby of Blair House for residents and visitors to see the building’s solar generation in real time. Tower is also planning to install a viewing platform on the roof in order to provide tours to the industry and community. Tower has heard from residents that their sustainability commitment was a factor in why they chose to live at The Blairs, and they enjoy being able to see the numbers associated with the solar system.
The Tower Companies Installs Rooftop Solar on 1960s High-Rise Building with Full Occupancy - Better Buildings Solution Center

Solar generation dashboard

FINANCING
Tower chose to purchase the system outright in lieu of using a third-party financing mechanism. The investment will yield a 100% after-tax payback in the first year and an internal rate of return of 30% over 20 years. Tower was able to achieve a one-year payback on the approximately $350,000 investment by incorporating the following:

- Annual Energy Savings of about $20,000 – Since the solar array serves the building’s common areas, the building owner receives the full benefit.
- Local Incentive – Tower executed a 10-year SREC agreement with a local company, Sol Systems. Blair House lies on the Maryland/D.C. border and ties into the D.C. feeder lines, which allowed them to secure D.C. Solar Renewable Energy Certificates (SRECS).
- State Rebate – Maryland Energy Administration (MEA) rebate program for commercial solar
- MACRS Depreciation – All benefits are accelerated to year one.
- Federal Investment Tax Credit (ITC) – 30% for projects completed in 2019

OUTCOMES
The Tower Companies successfully implemented an internally financed on-site solar project for an older building, without the need to take on external financing partners, by utilizing a combination of energy savings and available local, state and federal incentives. The operational cost savings allows the team to invest in other sustainability projects and amenities for residents, ensure efficient operations, and meet the company’s carbon goals.

Tower plans to expand their on-site renewable energy portfolio in the coming years with over 1MW

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in the pipeline. The company hopes that sharing its challenges and solutions from this project will lead to greater adoption of onsite renewables for others in the industry.

MEASURING SUCCESS
The estimated annual production of the solar installation is more than 150,000 kWh. This equals almost 10% of the total building energy demand and enough to power the equivalent of 75 apartments. The investment is on track to yield a 100% payback in the first year after tax with an internal rate of return of approximately 30% over 20 years. The project will contribute to Montgomery County’s Zero Carbon Goal, which aims to reduce greenhouse gas emissions 80% by 2027 and 100% by 2035.