

# SYRACUSE UNIVERSITY NET ZERO LIVING LAB

Winding Ridge Rd, Syracuse, New York



The Net Zero Living Lab is a retrofit demonstration project, bringing an 8-unit dormitory on the Syracuse University campus net zero energy use. The project prioritized developing replicable approaches to reducing emissions through electrification retrofits.

The project was supported by a \$1.39 million grant from the New York State Energy Research and Development Authority (NYSERDA) REV Campus Communities Energy to Lead program and \$200,000 from the Syracuse University Climate Action Plan. The research conducted as part of the "living lab" spanned the entire scope of the project, from evaluating the existing building, modeling energy and costs, installing retrofit systems, and evaluating energy use to collecting post-occupancy data.

Taitem provided full design and construction phase services for the conversion of the existing student housing to net zero energy, which included design for a new high efficiency HVAC system and performance specifications for solar PV. Taitem also provided energy consulting services to support the net zero energy design and the university's REV Campus Challenge. This included energy modeling, support in the development of schematic design net zero energy solution packages, support for design teams with construction phase review and verification, ventilation air flow testing, blower door testing, and will support the one-year post occupancy energy usage analysis.



**TOTAL BUDGET** \$1.59 million

**LOCATION** Syracuse, NY

**SERVICES** zero energy retrofit consulting: including mechanical, electrical, and plumbing design, construction phase support and inspections, energy consulting, and energy modeling

**COMPLETION** Summer 2022

**REFERENCE** Nina Sharifi, Assistant Professor, Syracuse University, School of Architecture, [nmsharif@syr.edu](mailto:nmsharif@syr.edu)

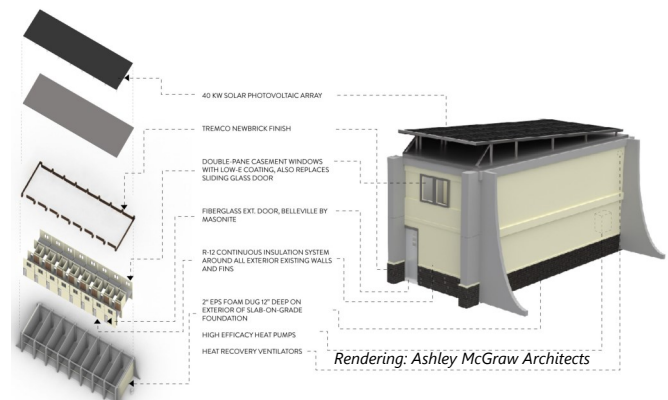


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Taitem collaborated with the project team including the Net Zero Retrofit Living Lab at Syracuse University to retrofit eight student townhouses in a way that reduced energy use by 80% and dramatically improved air quality at a construction cost of about \$85,000 per unit.

In the United States, buildings are responsible for 40% of energy use and carbon emissions. 600 million tons of construction and demolition waste is generated annually. Additionally, we spend over 90% of our time indoors meaning the air quality and thermal comfort of our spaces have a significant impact on our health.



"The goal was to develop replicable approaches that can be applied to buildings constructed prior to 1980 in New York State. The pilot will produce data that can help those in cold climates reduce energy use through sustainable design, construction, and technology integration."

**—Nina Sharifi, Assistant Professor of Architectural Technology, Syracuse University**



The Net Zero Retrofit Living Lab at Syracuse University was a three-year project that identified, developed, implemented, and tested retrofit approaches, including a demonstration project with campus apartment housing. The living lab spanned the entire scope of the retrofitting project, from evaluating the existing building, modeling energy and costs, sourcing low-carbon materials, installing retrofit systems, evaluating energy use, and collecting data once the building is reoccupied.



Before the retrofit, the Winding Ridge Apartment had 7638 KWh of HVAC Energy Usage (KWh) whereas after the renovation and retrofit it is now 1446 KWh. Key design strategies included thru-wall ERV, U-0.27 Window (Dual Pane Casement), Continuous Insulation, Thin Brick, and Cold-Climate Heat Pump.