Whitney Young Manor

- Yonkers, NY
- 230,000 SF
- 195 apartments
- 2 affordable multifamily buildings built in 1974

Empire Building Challenge
PARTNER
Reimagining Low-carbon Buildings

How to leverage recapitalization to achieve carbon neutrality and transform the affordable housing sector

Project Team:

BRIGHT POWER

Omni New York LLC

Curtis + Ginsberg Architects

SHARC ENERGY

Disclaimer: The project plan outlined in this presentation is in its early design stage and can be subject to potential changes in the future.

Whitney Young Manor is an aging affordable housing complex with open balconies, inefficient electric resistance baseboard heating, electric window sleeve AC units, and a gas-powered hot water heater.

The project team believes that with care, planning, and the appropriate resources, retrofitting these residential buildings can be equitable for tenants, beneficial to the environment, and financially feasible for owners. Omni leverages the recapitalization cycle of the property to upgrade its infrastructure and include decarbonization measures to meet its climate goals.

This project prioritizes intensive load reduction through envelope improvements and hydronic distribution to improve resident comfort while reducing carbon emissions, utility spend and maintenance costs.

NYSERDA Investment	Total Project Investment
$5 Million	$12 Million

Whitney Young Manor demonstrates the benefits of over-cladding and hydronic distribution to enable heat pump technology

Envelope Improvements: Over-cladding using Exterior Insulation and Finishing System (EIFS) helps reduce heat loss and air infiltration while avoiding façade maintenance costs associated with LL11. This measure is combined with the new Dedicated Outside Air System (DOAS) to make sure adequate fresh air is injected into the building.

Hydronic Distribution: The new water-based distribution piping will enable the integration of different heating sources and allow heat sharing between end-uses, such as DHW production during cooling season. The construction team plans to pilot cross-linked polyethylene (PEX) piping to reduce cost and improve durability.

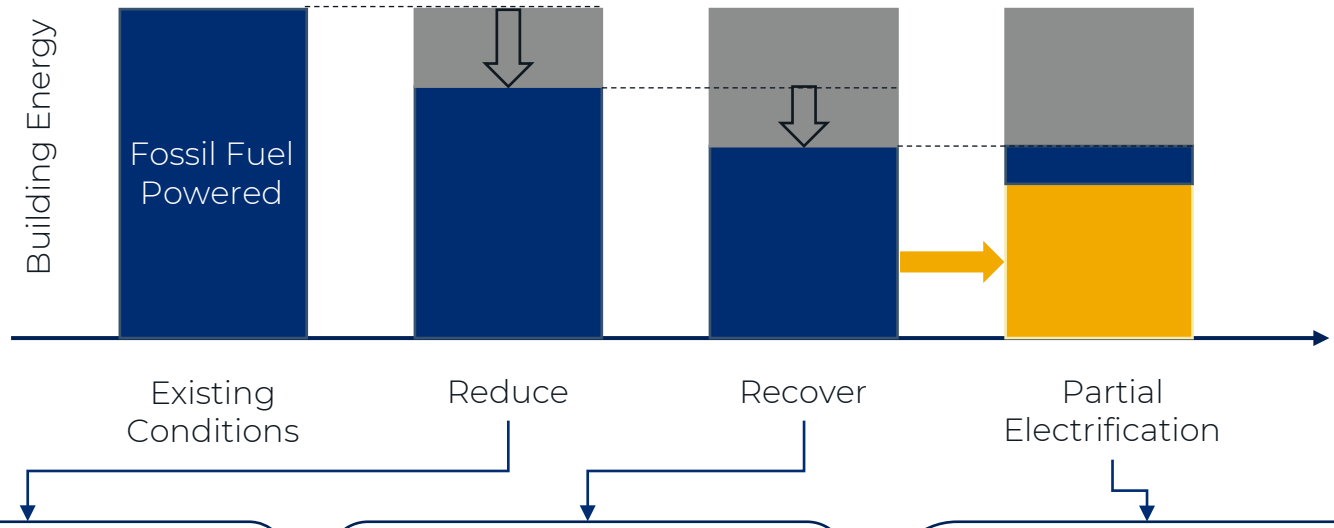
Heat Source Optionality: The project team plans to integrate different heat sources connected to the central hydronic piping. This includes centralized air source heat pumps, Wastewater Energy Transfer (WET) system and gas-fired condensing boilers as back-up.

2019 Baseline	Expected by 2035	
96 kBtu/SF/yr	**48** kBtu/SF/yr	↓ 50%
54% Natural Gas + **46%** Electricity	**25%** Natural Gas + **75%** Electricity	
1,456 tCO2e/yr	**273** tCO2e/yr	↓ 81%

Resource Efficient Decarbonization (RED):

An incremental methodology and integrated design process combined with strategic capital planning creates a path towards carbon neutral buildings.

A holistic approach and phasing can make decarbonization technically and economically feasible.



Reduce Energy Load

- **New hydronic distribution:** High efficiency water-based distribution system, lower supply temperature
- **Dedicated Outside Air System (DOAS):** decouple ventilation from heat and cooling systems
- **Envelope Improvements:** overclad, roof insulation and window replacement

Recover Wasted Heat

- **Wastewater Heat Recovery:** Recapture heat from wastewater using WSHP
- **Energy Recovery Ventilator (ERV):** Recapture heat from ventilation exhaust to condition make-up air

Partial Electrification

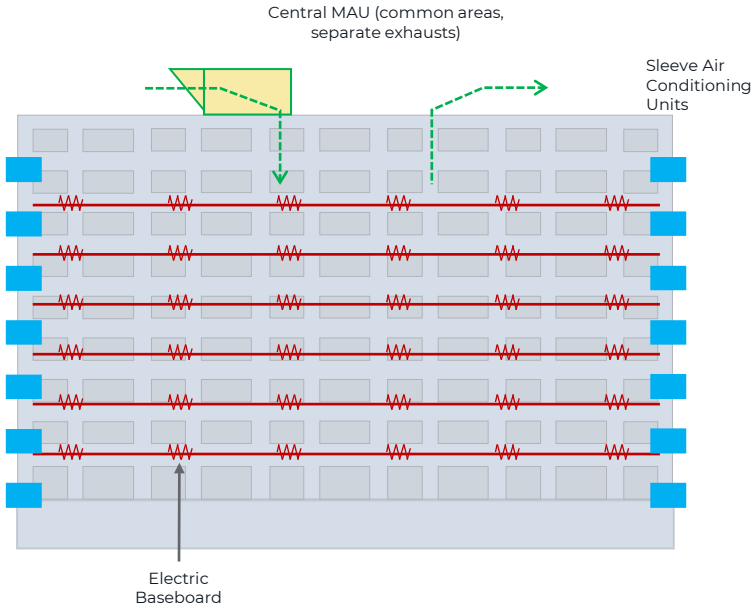
- **Central Air Source Heat Pump (ASHP):** Maintain design temperatures for the hydronic loop
- **Water Source Heat Pump (WSHP) for Domestic Hot Water (DHW):** DHW production supplied by hydronic loop
- **Back-up gas condensing boiler:** Provide supplemental heat during cold events as resiliency

Whitney Young Manor Decarbonization Plan

Heating
Cooling
Ventilation

Key Takeaways: Affordable Housing Recapitalization, Tenant Total Cost Reduction, Failing Envelope

BEFORE



2023:

Envelope Improvements
EIFS over uninsulated masonry, new windows, new roof

Dual-Temp Hydronic System
New 2-pipe hydronic piping drilled through common areas.

Central ASHP
Install 2 ASHPs to produce low temperature hot water and chilled water for in-unit FCUs

Back-up Gas Boiler
For use during power outages and extreme cold events

Fan Coils installed in units

Central DOAS+ERV
Heat pump DOAS with ERV to supply tempered air to units via common areas,

WSHP for DHW
Install modular WSHPs supplied by hydronic loop

2024:

Wastewater Energy Transfer (WET) System
Install 18,000 gal sewage tank and use Sharc Energy heat pumps to recover heat and supplement central ASHPs

AFTER