

---

# Nonantum Village Place



## Pathway to Zero Carbon Emissions

**A case study of decisions made and the Zero over Time Process**

**Electrifying Affordable Multifamily Housing**

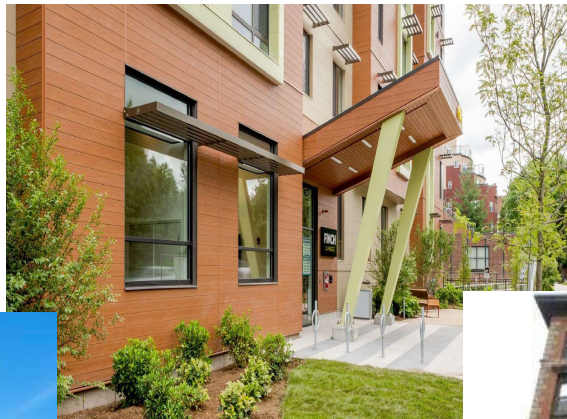
Decarbonizing Communities & Campuses May 3, 2023

Prepared by HRI/Cascap  
New Ecology Inc. (NEI)





HRI is a non-profit affordable housing organization that develops and preserves affordable, high-quality rental housing.



**Cascap Inc. is now part the HRI portfolio.** 100% of Cascap housing is affordable, and is primarily service enriched housing

**We are dedicated to deliberate energy efficiency and material selection practices to both reduce our carbon footprint and improve the lives of our residents.**



# Nonantum Village Place

Built in 2004 in Newton MA  
35 one- bedroom apartments  
20,000 sq. ft. building

HUD 202 Supportive Housing for the Elderly  
100% affordable 50% of AMI maximum



## GOALS

### Owner:

- At end of building components useful life, improve energy efficiency
- Decarbonize building
- Maintain comfort and indoor air quality for Seniors
- Incorporate maintenance and operation awareness

### City of Newton Climate Action Plan:

- Carbon Neutral by 2050

### Zero Over Time Plan:

- Energy Use and Carbon Reduction
- Improved Resilience
- Address Embodied Carbon

## Challenges/concerns

- Insufficient replacement reserve funds to complete energy, capital goals
- Construction during Covid
- Air Source Heat Pumps (ASHP) in elderly building
  - tenant's comfort
  - equipment performance in winter
- Fuel shifting: Changing from gas to electricity. Uncertain operating cost savings
- LEAN/Mass Save- setting new policies on how decarbonization evaluated



## Key Partners

### Funders:

City of Newton CPA	\$500K
LEAN	\$207K
NVP replacement reserves	\$144K
City of Newton CDBG	\$100K
Charlesbank Foundation	\$ 50K

### Technical Assistance

- LISC
- New Ecology Inc. (NEI)- ZOT
- Resonant Energy- Solar studies
- BC Stewart-CNA
- Wegowise- data on energy/water use

Property Management Company:  
Wingate Companies

### Contractors

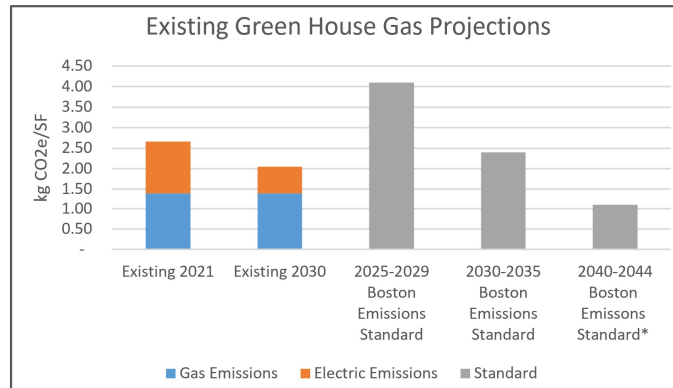
- J&S Building Exteriors
- K J Miller Mechanical Inc.
- Smartbuild LLC

# Process and Timeline





# Nonantum Village Place



## Tools

Capital Needs Assessment 2021

Zero over Time Process May 2021

Energy Audit

Design Charette

Zero over Time Report

City of Newton Climate Action Goals  
willingness to fund decarbonization.

NEI engineers working with contractors  
and property management to define  
scope and equipment

# Apartment Heating and Cooling Timeline



2021: Current System

- Central Gas-Fired Condensing Boiler
- Hot Water Coil in Fan Coil Unit
- 80% Efficient Heating, 11 SEER cooling



2022: Hybrid Heat Pump

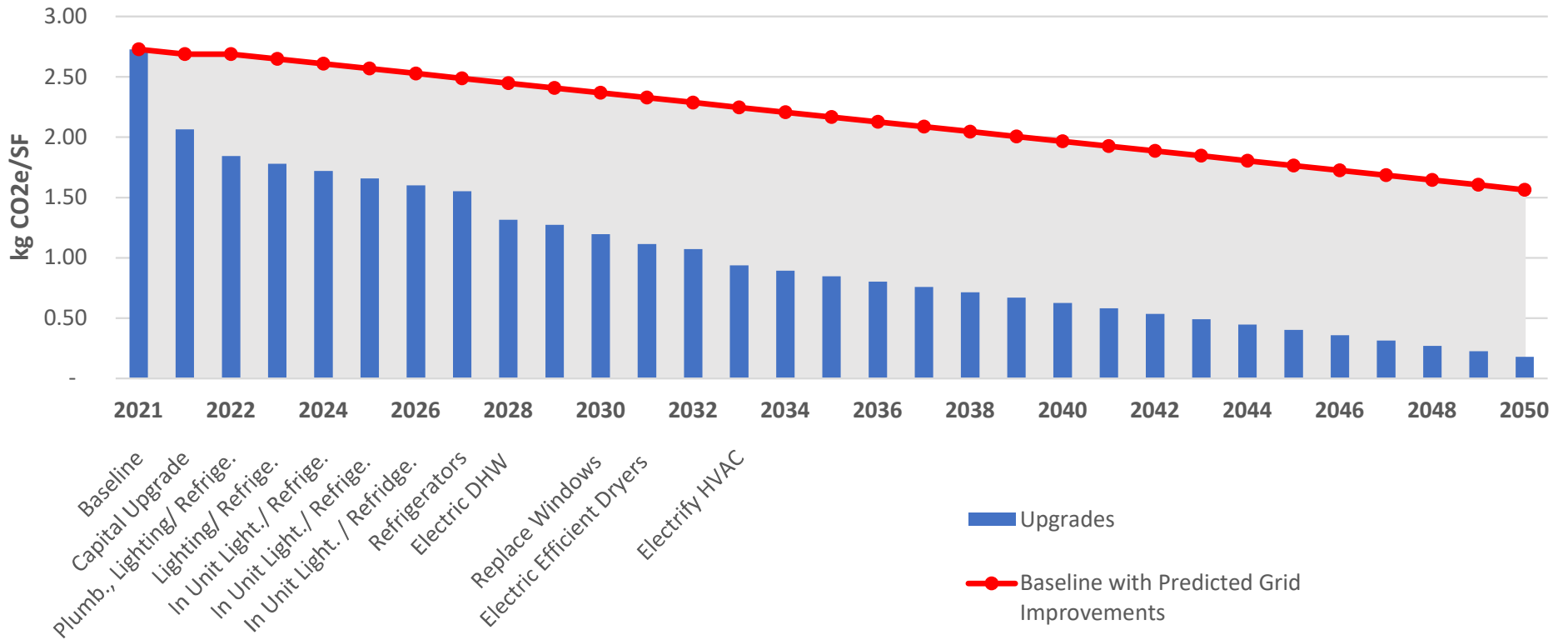
- Central Gas-Fired Condensing Boiler (Below 30F)
- Apartment Heat Pumps (Above 30F)
- Hot Water Coil and Heat Pump in Fan Coil Unit
- 80% Efficient Gas HW, 3.1 COP Heat Pump, 20 SEER Cooling



2033: Full Electrification

- Apartment Heat Pumps (All Temperatures)
- Heat Pump in Fan Coil Unit
- Above 30F: 3.1 COP, Below 30F: 2.4 COP, 20 SEER Cooling

## Carbon Emissions for Baseline Model and Model with Upgrades Over Time



Using NREL’s Massachusetts electric grid carbon emissions projections between now and 2050, the graph above shows the passive carbon savings from the greening of the energy grid if no upgrades are performed (red line) and the savings if the upgrades noted are performed in tandem with the greening of the electric grid (blue bars).



---

## Key Take Away Points

- Review portfolio for properties with high energy usage or needed capital retrofits
- LISC funding Energy Audit/ZOT was an important first step
- Zero Over Time (ZOT) process established priorities and sensible next steps, timeline
  - *Melded CNA and Sustainability/decarbonization goals.*
  - *Energy Audit Data- resource for funding application/discussion with funders.*
  - *Design Charrette gets everyone on the same page, identifies areas where need more information*
- NEI technical staff worked with contractors to provide informed decisions on scope and specific equipment.
- City of Newton Climate Action Goals were central to City funding priorities.



**LISC BOSTON**

**Lean Multifamily**



[mhannon@cascap.org](mailto:mhannon@cascap.org)   [www.homeownersrehab.org](http://www.homeownersrehab.org)