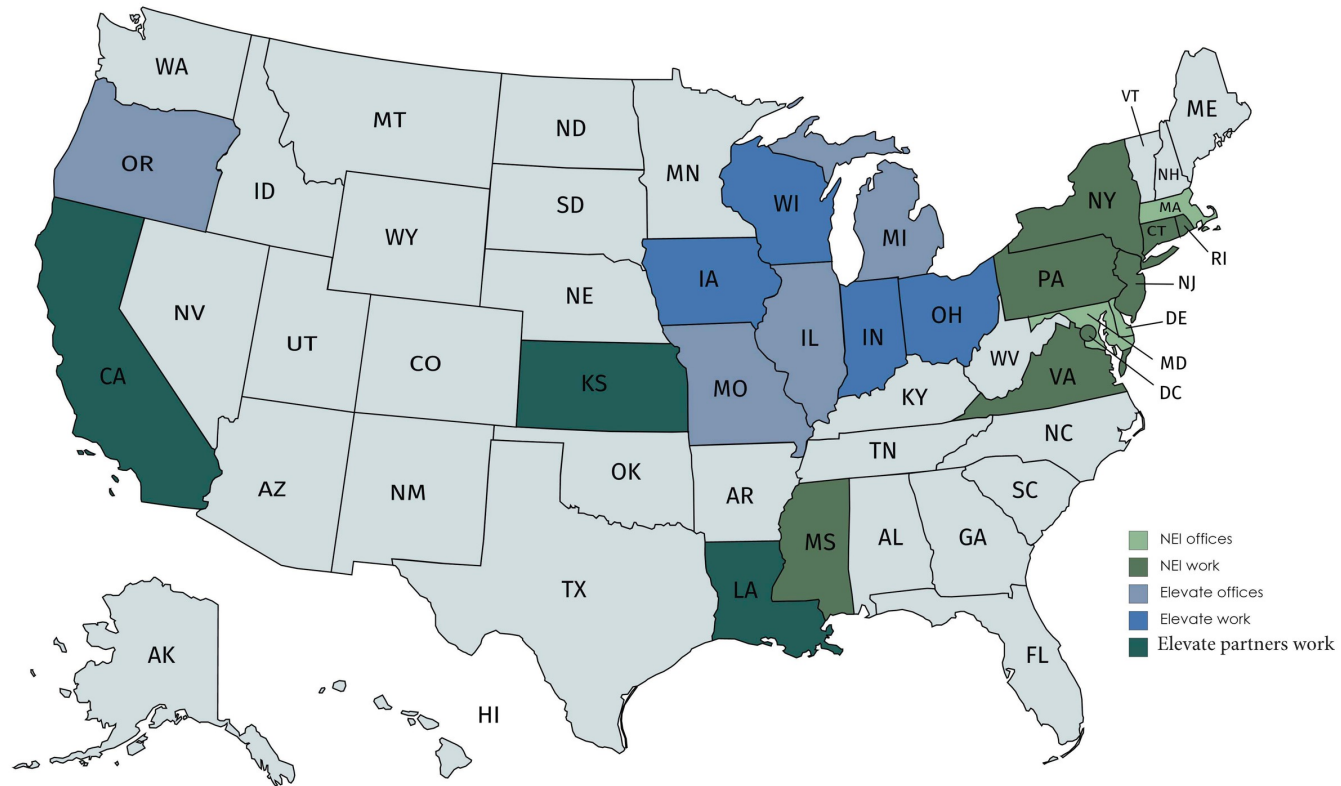




MD Energy
Transition Taskforce
– LI Subgroup
9.13.23

Lessons From the Field – New Ecology

New Ecology Experience



Agenda

Energy Efficiency Program Experience

Case Studies

Lessons Learned

Programs – Massachusetts and Delaware

MASS LEAN



- ☐ 100% subsidy for gas and electric energy efficiency measures, TA and PM
- ☐ Building Assessment, Project Management and Inspections
- ☐ <https://leanmultifamily.org/>

Energize DE AMFH



- ☐ Subsidized energy and gas energy efficiency and renewable energy measures, TA and PM
- ☐ 2017-2022 30-50% implementation subsidy - limited interest
- ☐ 2023 90% Implementation subsidy- intense interest
- ☐ <https://www.energizedelaware.org/residential/affordable-multifamily-housing/>

DE – Carrington Way

165 apartments
50 years old

Scope

- **Air sealing and insulation**
- **LED Lighting**
- **Ventilation**
- Plumbing fixtures
- Heat Pumps (boilers)
- Condensing gas water heaters (atmospheric)

\$445,000 Rebate

PROJECTED SAVINGS

- 57% energy use reduction
- 44% carbon emissions reduction*
- 42% water use reduction



MA - Nonantum Village Place Apartments (ZOT)

- **Location:** Newton, MA
- **Project Type:** HUD 202 Elderly Supportive
- **Unit Count:** 35 1-BR Units
- **Year Built:** 2004
- **Owner:** CASCAP/
Homeowners Rehab



Systems/Components in Need of Replacement:

- Roof
- Siding and trim repairs
- Cooling units serving apartments
- Apartment-based heating/cooling distribution system
- Common area HVAC equipment



Short-Term Capital Project Efficiency Measures:

- Replace Degraded Roof:**

- Repair moisture damage, increase insulation to R-50, install white membrane in preparation for future PV system.

- Install Air Source Heat Pumps:**

- Replace existing cooling units with air source heat pumps (1 per apartment)
- Keep existing gas-fired boilers for hot water and for use during very cold temperatures

- Replace Common Area HVAC Units:** Replace existing gas fired rooftop units with electric.

- Units provide heating, cooling, and ventilation to common areas

- Solar + Storage:**

- Install 35kW Solar system and 22.9 kWh battery storage for resilience and operating costs savings

Apartment Heating and Cooling Timeline

1.



2021: Current System

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

2.



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

3.



2023: 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

Zero Over Time Plan

YEAR	ECM	MOTIVATION/TRIGGER	FUNDING SOURCE
2022-23	Packaged Capital Upgrade	Cooling equipment end of useful life/severe water damage to roof, solar + storage*	Fundraising: City of Newton, LEAN, MA DEP, foundations
2024	Low flow plumbing	Operating savings/low upfront cost	Toilets: Replacement reserves; Faucet aerators and showerheads: Operating reserves
2024-27	LED Lighting Replacement	Operating savings	Operating reserves at unit turnover
2024-28	Energy Star Refrigerators	Operating savings	Replacement reserves
2028	Electric Heat Pump Water Heaters	Domestic hot water tank end of useful life	Fundraising necessary; target future utility incentive programs
2030	Energy Star Windows	Windows end of useful life	Replacement reserves
2031	Electric Dryers	End of laundry equipment lease contract	Resources may be needed to increase the electric capacity of laundry room
2033	Fully Electrified Heating	Boiler end of useful life	Replacement reserves for air source heat pump replacement in 2038 and decommissioning of boiler plant

Treehouse Apartments

(Deep Energy Retrofit)

- **Location:** Easthampton, MA
- **Year Built:** 2007
- **Project Type:** Elderly Supportive
- **Unit Count:** 60 total
 - 48 elderly
 - 12 family units
- **Owner:** Beacon Communities



Selected Retrofit Measures

- Add Roof Insulation – Added to Underside of Roof
- Add Exterior Insulation – 1.5 inches mineral wool
- Replace Windows – Double Pane, U-0.25
- Add External Air Barrier, Target: 2 Air Changes/Hour
- Replace Gas Furnace and A/C with 1 Heat Pump Unit
 - Benefit: Add a second zone for comfort!
- Replace Gas Water Heaters with Electric Resistance
- Replace Lightbulbs with LED throughout
- Replace faucet aerators and Toilets with Low Flow Models
- Add Ventilation – Energy Recovery Ventilation

Funding Support:

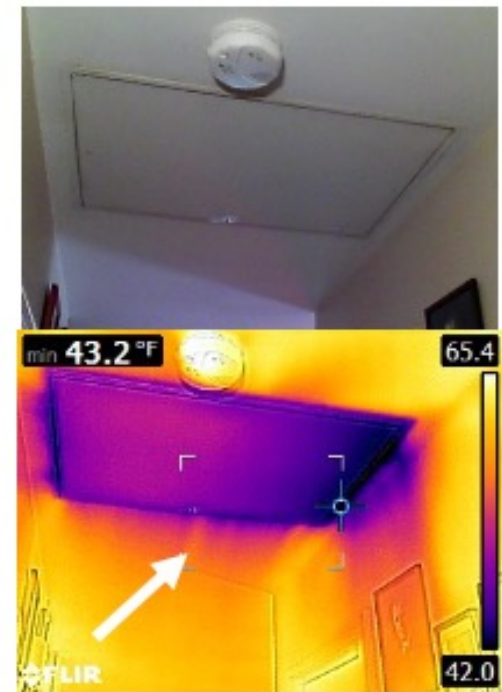
- \$750,000 Competitive Grant Funding
- \$650,000 Utility Program Funding

Building 6 (elderly units)

Building Volume: 17,816 CF

CFM @ 50 : 1,526 CFM

ACH @ 50 : 5 ACH



Attic Hatch without gasket

Modeled Energy Savings

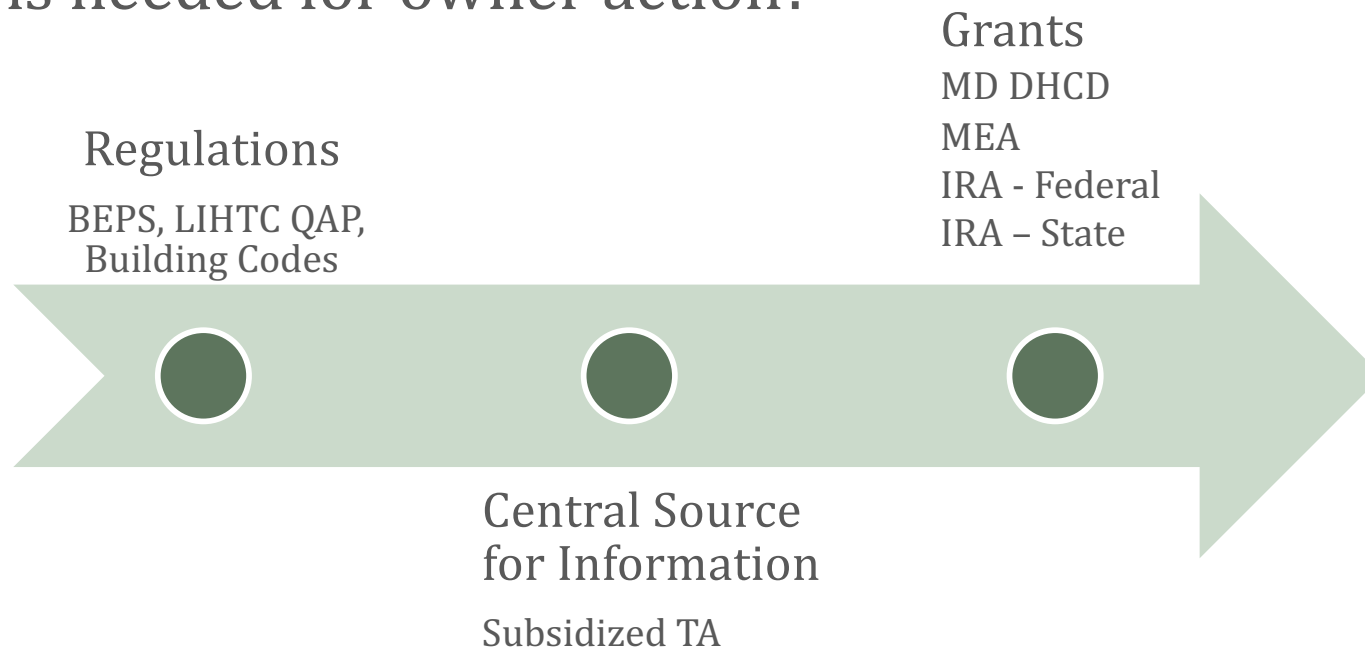
PROJECTED SAVINGS

- 50% energy use reduction
- 24% carbon emissions reduction
- 21% water use reduction

Utility Costs in Mass.

- Modeled cost \$0.24/kWh
- +12% Utility Costs

What is needed for owner action?



<https://www.dcseu.com/retrofitaccelerator>



Questions and Discussion