PathStone’s work with Clean Heating and Cooling in the LMI Sector

NY GEO Conference

April 16, 2019
Energy Efficient Features:
· Solar Panels
· 2 Air Source Heat Pumps 22K BTU
· Heat Pump Water Heater
· R-22 insulation Walls
· R-70 insulation Attic
· Heat Pump Dryer
· Drain Waste Heat Recovery
· Triple Pane Windows
· Energy Recovery Ventilator
· No gas meter
· Estimated monthly utility bill $50 depending on occupants usage

Asking price: $84,900
Clean Heating and Cooling Communities Part B and C

B. Workforce Development

C. Community partners- HOME Rochester, Habitat for Humanity, Weatherization, City of Rochester

Loan Loss Reserve for LMI lending
Real Estate Development

Eastman Reserve- 118 Unit with VRF system

Perinton Commons- 3 units Passive, 3 units Net Zero- case study

NYSERDA Net Zero Portfolio PON
Zero Energy Modular
NY GEO Conference

John Scicchitano

April 11, 2019
Airtight construction

Insulation

Continuous thermal envelope

High-efficiency appliances & lighting

Fresh air ventilation

Air source heat pumps
Factory-Built Home Types

- **Mobile Home**
  - No code, pre-1976

- **Manufactured Home**
  - Meets HUD code at time of construction, 1976 and later

- **Modular Home**
  - Meets state and local codes at time of construction
MMH Park Issues

- Affordability: energy burden – rare access to natural gas
- Park infrastructure
- Home age
- Structure and safety
- Health
City Housing Issues

- Affordability: energy and housing burden
- Availability
- Quality
- Vacant/zombie properties
- Housing jobs

From City of Schenectady
Proposed 2019 Budget
152,810 occupied MMHs in New York State

Just 2% of housing units statewide

But, 5 – 15% in most upstate counties
Median vintage is 1985

26% rented; 74% owned or financed

36% located in registered mobile home parks
MMH Affordability

**Median Household Income**

**Source:** 2015 AHS

<table>
<thead>
<tr>
<th>Owner</th>
<th>Renter</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMH $42,000</td>
<td>All Housing $74,000</td>
</tr>
<tr>
<td>MMH $26,200</td>
<td>All Housing $35,000</td>
</tr>
</tbody>
</table>

**Household Income, MMH Households**

**Source:** 2015 AHS

- Under $20,000…: 33%
- $20,000 - $40,000…: 17%
- $40,000 - $80,000: 17%
- $80,000 and Above: 17%
MMH residents face a higher energy burden

MMH LMI Households 11.5%

All LMI Households 9.2%
Impacts of ZEM

• Economic
  • Reduction of Energy Burden (6% of income)
  • Reduction of Housing Burden (30% of income)

• Environmental
  • Greenhouse Gas emissions, air quality

• Social
  • Age, quality of housing
  • Health of housing: social determinants
  • Jobs
ZEM Cash Flow

• Higher first cost is more than offset by lower combined mortgage and energy costs
  • Lower financing cost
  • Low or no energy costs

• Residents pay less each month to live in a more comfortable, efficient home
Statewide Impacts of ZEM

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Estimated Benefits of ZEM</strong></td>
<td>2019-2030</td>
</tr>
<tr>
<td>Number of years</td>
<td>11</td>
</tr>
<tr>
<td>Number of homes</td>
<td>10,000</td>
</tr>
<tr>
<td>Electric savings (kWh)</td>
<td>68,435,697</td>
</tr>
<tr>
<td>Oil savings (gal)</td>
<td>2,845,738</td>
</tr>
<tr>
<td>Propane savings (gal)</td>
<td>2,834,211</td>
</tr>
<tr>
<td>Energy cost savings</td>
<td>$28,942,986</td>
</tr>
<tr>
<td>Avoided emissions (lbs. CO2)</td>
<td>185,107,471</td>
</tr>
</tbody>
</table>
Urban Infill
New Park or Duplex Development
Thank you!

John.Scicchitano@nyserda.ny.gov
Christopher.Coll@nyserda.ny.gov
Additional Slides
Home Replacement in Coop Park
## Energy Modeling Results

<table>
<thead>
<tr>
<th>Fuel Consumption</th>
<th>HUD</th>
<th>ZEM</th>
<th>HUD</th>
<th>ZEM</th>
<th>HUD</th>
<th>ZEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity (kWh)</td>
<td>7,935</td>
<td>5,729</td>
<td>7,970</td>
<td>6,229</td>
<td>7,910</td>
<td>6,680</td>
</tr>
<tr>
<td>Propane (gal)</td>
<td>459</td>
<td>-</td>
<td>624</td>
<td>-</td>
<td>718</td>
<td>-</td>
</tr>
<tr>
<td>PV Production (kWh)</td>
<td>-</td>
<td>(5,912)</td>
<td>-</td>
<td>(6,688)</td>
<td>-</td>
<td>(6,429)</td>
</tr>
<tr>
<td>Total (MMBtu)</td>
<td>69</td>
<td>(1)</td>
<td>84</td>
<td>(2)</td>
<td>93</td>
<td>1</td>
</tr>
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</table>

### Fuel Costs

<table>
<thead>
<tr>
<th></th>
<th>HUD</th>
<th>ZEM</th>
<th>HUD</th>
<th>ZEM</th>
<th>HUD</th>
<th>ZEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>$1,432</td>
<td>$1,034</td>
<td>$1,439</td>
<td>$1,124</td>
<td>$1,428</td>
<td>$1,206</td>
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<tr>
<td>Propane</td>
<td>$1,424</td>
<td>$0</td>
<td>$1,935</td>
<td>$0</td>
<td>$2,228</td>
<td>$0</td>
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<tr>
<td>PV Production</td>
<td>$0</td>
<td>-$1,067</td>
<td>$0</td>
<td>-$1,207</td>
<td>$0</td>
<td>-$1,160</td>
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<tr>
<td>Total</td>
<td>$2,857</td>
<td>-$33</td>
<td>$3,373</td>
<td>-$83</td>
<td>$3,655</td>
<td>$45</td>
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### Energy Cost Savings

<table>
<thead>
<tr>
<th></th>
<th>Climate Zone 4A</th>
<th>Climate Zone 5A</th>
<th>Climate Zone 6A</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$2,890</td>
<td>$3,456</td>
<td>$3,610</td>
</tr>
</tbody>
</table>

*Baseline heating fuel/system: Propane furnace
*Fuel cost assumptions: $0.18/kWh, $3.10/gal propane, $3.22/gal fuel oil