

# Net Zero Energy Renovation



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## Project Background

Renovation of a century old 1,000 square foot New England beach cottage in Jamestown with several goals – increase the square footage to accommodate a family of four, preserve the charm and local characteristics of the home and achieve Net Zero Energy (i.e. the home will use only as much energy as it can produce). The renovation includes a two-story addition with a screened-in porch and construction of a small post-and-beam barn behind the original house.

## Project Highlights

Multiple efficiency measures were included in the building design and construction to help achieve Net Zero Energy including high performance insulation, equipment, lighting, air sealing and windows.

### Insulation

- Existing foundation and slab were lined with rigid mineral-wool panels and rigid foam panels
- Basement walls in the addition were factory-built insulated, reinforced concrete panels installed on-site
- Stud walls above the basement were filled with spray foam, with rigid foam applied to the exterior on top of a vapor barrier
- The roof was insulated with closed-cell spray foam, and a combination of 2x6s and OSB sheathing filled with layers of rigid mineral-wool board was installed on both the old and the new rafter systems

### Air Sealing Technique

- AeroBarrier®

### Air Leakage Results

- Prior to air sealing: 4 air changes per hour (ACH)
- Post air sealing: <1 ACH

### Heating & Cooling Equipment

- 10.45 HSPF mixed ducted and non-ducted mini split heat pump, with a heat-recovery system that monitors five zones and can move heat from one area to another

### Windows

- Triple-glazed, argon-filled, 0.25-0.27 SHGC

### Ventilation

- Energy recovery ventilation system (ERV) provides continuous fresh air

### Renewables

- PV solar array on the barn roof

### Lighting & Appliances

- LED bulbs and Energy Star® appliance

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