

# The Climate Friendly Homes Fund: Early Closings Case Study

## Construction Cost Comparison: Direct Metering vs. Centrally-Wired Systems

This case study examines the projected versus actual construction costs associated with electrifying two small multifamily buildings in Troy, NY. Both properties are receiving grant funding through the Climate Friendly Homes Fund (CFHF), a program funded by New York State and administered by The Community Preservation Corporation (CPC) to advance the electrification of affordable housing across the state. One building features direct tenant metering, while the other utilizes centrally-wired heating - these differing configurations significantly influence electrification efforts, offering valuable insights into scaling decarbonization across the affordable housing sector.

### BUILDING PROFILES:



#### BUILDING A:

**Year Constructed:** 1920

**Location:** Troy, NY

**Size:** 1 Building, 5 Units, 4,000 Gross Square Feet

**Utilities:** Heating and cooling paid by tenant; water paid by owner

**Grant Size:** \$125,000

Full-electrification 100% covered by CFHF grant



#### BUILDING B:

**Year Constructed:** 1850

**Location:** Troy, NY

**Size:** 1 Building, 8 Units, 7,159 Gross Square Feet

**Utilities:** Cooling paid by tenant; heating and water paid by owner

**Grant Size:** \$232,000

Full-electrification 99% covered by CFHF grant

### SCOPES OF WORK:

#### BUILDING A

- Replacement of existing electric resistance baseboards with directly-metered mini-split air source heat pumps (Mitsubishi M-Series)
- Replacement of existing gas-fired conventional boiler with centralized integrated tank heat pump hot water heater (A. O. Smith)
- Related electrical service upgrades (including utility service upgrade covered by National Grid)
- Air-sealing upgrades

#### BUILDING B

- Replacement of existing one-pipe steam system with centrally-metered mini-split air source heat pumps (Mitsubishi M-Series)
- Replacement of existing central electric resistance hot water heater with centralized integrated heat pump hot water heater (Rheem ProTerra)
- Related electrical service upgrades (including utility service upgrade covered by National Grid)
- Air-sealing upgrades
- Historic preservation work
- Lead and asbestos testing

## A LOOK AT CONSTRUCTION COSTS:

Below is a comparison between Buildings A and B's projected and finalized construction costs. The projected cost represents the original auditor estimate, while the actual cost represents the contractor's finalized price.

### BUILDING A:

|                             | Projected Cost | Actual Cost |
|-----------------------------|----------------|-------------|
| Space Heating and Cooling   | \$16,800       | \$12,600    |
| Domestic Hot Water          | \$1,700        | \$3,100     |
| Electrical Service Upgrades | \$1,200        | \$2,232     |
| Other Measures              | \$3,208        | \$3,303     |
| Total Cost/Unit             | \$22,908       | \$21,235    |

7% decrease

### BUILDING B:

|                             | Projected Cost | Actual Cost |
|-----------------------------|----------------|-------------|
| Space Heating and Cooling   | \$7,144        | \$11,338    |
| Domestic Hot Water          | \$2,230        | \$1,937     |
| Electrical Service Upgrades | \$750          | \$8,661     |
| Other Measures              | \$6,217        | \$2,702     |
| Total Cost/Unit             | \$16,341       | \$24,638    |

34% increase

## KEY TAKEAWAYS + LOOKING AHEAD

Buildings A and B share many similarities: they are located in the same city, owned by the same entity, and outfitted with the same electric heating systems installed by the same contractor. The key distinction lies in their metering configuration - Building A uses direct metering, while Building B uses a centralized metering system. This difference provides a valuable lens through which to examine how metering impacts the cost of electrification:

- Building A experienced a 7% decrease from the projected to actual cost, largely due to conservative initial estimates for space heating and cooling equipment and installation.
- On the other hand, Building B experienced a 34% increase in actual costs, primarily driven by the electrical service upgrades required to meet program requirements that prevent cost-shifting, keeping heating and hot water systems centrally-metered.

A closer look at Building B reveals that 59% of its cost increase stemmed from electrical service upgrades. However, this was compounded by additional challenges: historic preservation constraints that required all wiring to be routed inside the building rather than on the facade, greater load capacity upgrades than Building A, and the need for more supplemental heating in common areas.

Electrifying centrally-metered systems presents unique challenges and higher costs due to system design incompatibility, disruptive and complex installation processes, increased electrical load and grid capacity requirements, and the need to install additional wiring to individually meter apartments from a central panel. As electrification efforts expand, understanding these nuances will be essential for planning and budgeting, especially in older or historically significant buildings. Simultaneously, as more of these projects are completed, cost estimates will become more accurate with a growing body of real-world data.

## WHAT COMES NEXT?

All projects coming through CFHF will be required to benchmark consumption for three years follow construction completion - be on the look out for a follow-up to this case study with performance data from these two buildings!