

Energy Efficiency in Affordable Urban Living

PERFORMANCE OUTCOMES:

27% REDUCTION IN TOTAL ENERGY CONSUMPTION

19% DECREASE IN TOTAL ENERGY COSTS

ELLIOT APARTMENTS, NONPROFIT HOUSING FOR FAMILIES AND INDIVIDUALS, MINNEAPOLIS, MINNESOTA

PROJECT SUMMARY

HVAC

- ★ 95% condensing gas boilers
- ★ ENERGY STAR® wall A/C
- ★ ENERGY STAR® 2-speed bathroom fans

DOMESTIC HOT WATER

- ★ 90% efficient domestic hot water

ENVELOPE

- ★ Pella® Impervia® windows (U-0.31)
- ★ Roof insulation (R-50)
- ★ Air sealing

LIGHTING & APPLIANCES

- ★ LED lighting in common areas and exterior
- ★ ENERGY STAR® refrigerators
- ★ Common area occupancy sensor

Elliot Apartments, a 1900s-era 24-unit apartment building for low-income families and individuals, consists of eighteen two-bedroom units and six one-bedroom units. It includes six units designated for the formerly homeless and 18 units affordable to households at 50 percent or less of area median income.

Project for Pride in Living's (PPL) Elliot Apartments building was in need of repairs and energy efficiency updates to ensure that it could continue to provide affordable homes into the future. In particular, inefficient mechanical systems, old windows, and drafts compromised resident comfort and caused high utility bills. PPL participated in Xcel Energy and CenterPoint Energy's Energy Design Assistance program to optimize energy conservation strategies and obtain access rebates. Energy modeling and project performance was carried out by The Weidt Group as part of the program, helping to maximize the impact of the \$187,487 energy improvement investment.

SOLUTIONS

The project reduced energy use by improving efficiency and reducing demand. The heating system was replaced with a new 95 percent efficiency condensing gas boiler and new fin tube radiators. This replacement accounted for the highest portion of energy cost savings with an estimated payback of 5.3 years. New ENERGY STAR® 9.78 energy efficiency ratio (EER) wall air conditioning units reduce electric use in the cooling season. Bathroom ventilation was also updated to ENERGY STAR® exhaust fans.

“We prioritize energy efficiency to save costs and improve Indoor Environmental Quality (IEQ).”

— Matt Soucek,
PPL, senior project manager

PROJECT OVERVIEW

DEVELOPER/OWNER Project for Pride in Living (PPL)

UNITS 24 BUILDINGS 1

YEAR OF CONSTRUCTION 1900

YEAR OF RENOVATIONS 2015

UTILITY PROVIDER Xcel Energy/
CenterPoint Energy

HEATING Hydronic

COOLING Through-wall units

UTILITY PAYMENT STRUCTURE
Owner-paid heat and hot water

The new hot water heaters run at 90 percent efficiency due to a dual tank system, which decreases energy use by running one boiler during the summer. The second boiler only fires when demand requires additional heating. The boiler sequencing can be reversed, extending the life span of the equipment and providing redundancies if one boiler were to fail. In addition, recirculation pumps were installed to keep the water ready for use rather than sitting idle and cooling in the supply lines.

Lighting energy use was decreased by placing occupancy sensors in storage, mechanical/electrical, and laundry rooms. Incandescent fixtures in both the exterior and interior were replaced with LED lights. The LED package is expected to reduce electric bills by 60 percent.

The old windows and high infiltration rates were responsible for 66% of the energy losses through the envelope. New windows and air sealing helped to drive down overall energy demand.

BENEFITS

Excluding the windows, the project has a seven and a half year payback (26 years

with the windows). In addition to energy and cost savings, resident comfort has been improved. Prior to the renovation, tenants regularly complained about cold and drafty units due to old windows with aluminum framing. The new windows have removed the draftiness felt in the units. Furthermore, the new windows have helped to mitigate noise coming from the interstate, located less than a block away.

BACKGROUND

The building is one of 10 buildings included in PPL’s DECC Recapitalization Project funded by Minnesota Housing, the City of Minneapolis, and grants. The project refinanced, renovated, and stabilized 10 existing affordable apartment buildings, preserving affordability in a south Minneapolis neighborhood.

The renovation of the building was a good fit for PPL, which has a long history of housing development and works to provide energy efficient and healthy indoor environments for low- and moderate-income families.

PROJECT SUMMARY	ENERGY RETROFIT INVESTMENT	REBATE	ANNUAL COST SAVINGS	ANNUAL ENERGY SAVINGS
ELECTRIC UTILITY		\$6,300	\$2,750	93,837 kBtu
GAS UTILITY		\$1,823	\$3,334	520,900 kBtu
PROJECT TOTALS	\$187,487	\$8,123	\$6,084	614,737 kBtu

Rebate, energy, and cost savings reported by Xcel Energy Design Assistance program

For more information and ways to act, visit: <http://www.mnshi.umn.edu/program/EE4A>

To learn more about the importance of choosing healthy, non-toxic building materials for energy efficiency retrofits, visit: <http://www.bgadata.org/EEHousingProducts/about/about-database>

